

Exhibit 33

<p style="text-align: center;">Page 1</p> <p>UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF CALIFORNIA SAN FRANCISCO DIVISION</p> <hr/> <p>) Case No. IN RE: BABY FOOD PRODUCTS) LIABILITY LITIGATION) 24-MD-3101-JSC)) MDL 3101) This document relates to:)) ALL ACTIONS))</p> <hr/> <p>* CONFIDENTIAL PURSUANT TO PROTECTIVE ORDER *</p> <p>VIDEOTAPED DEPOSITION of HANNAH E. GARDENER, SC.D. Thursday, July 31, 2025 9:07 a.m. DLA Piper LLP 33 Arch Street Boston, Massachusetts 02110-1447</p> <p>Job No.: 2500 Pages: 1 - 329 Reported By: Michelle Keegan, RMR, CRR, CSR</p>	<p style="text-align: center;">Page 2</p> <p>1 APPARENCES: 2 3 WISNER BAUM 4 By: Pedram Esfandiary, Esq. By: Monique Alarcon, Esq. (Zoom) 11111 Santa Monica Boulevard, Suite 1750 Los Angeles, California 90025 Phone: (310) 207-3233 Email: pesfandiary@wisnerbaum.com Email: malarcon@wisnerbaum.com Counsel for Plaintiffs</p> <p>5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25</p> <p>BRADY LAW GROUP By: Steven J. Brady, Esq. (Zoom) 1015 Irwin Street San Rafael, California 94901 Phone: (415) 517-7300 Email: mail@bradylawgroup.com Counsel for Plaintiffs</p> <p>ANAPOL WEISS By: Holly H. Dolejsi, Esq. (Zoom) 60 South 6th Street, Suite 2800 Minneapolis, Minnesota 55402 Phone: (651) 376-2872 Email: hdolejsi@anapolweiss.com Counsel for Plaintiffs</p> <p>WAGSTAFF & CARTMELL By: Diane K. Watkins, Esq. (Zoom) 4740 Grand Avenue, Suite 300 Kansas City, Missouri 64112 Phone: (816) 701-1140 Email: dwatkins@wcllp.com Counsel for Plaintiffs</p> <p>CLAGGETT & SYKES By: Heather Bishop, Esq. (Zoom) 4101 Meadows Lane, Suite 100 Las Vegas, Nevada 89107 Phone: (516) 247-9643 Email: heather@claggettlaw.com Counsel for Plaintiffs</p>
<p style="text-align: center;">Page 3</p> <p>1 APPEARANCES (Continued) 2 3 GORDON, REES, SCULLY, MANSUKHANI, LLP 4 By: Michael R. Klatt, Esq. 2705 Bee Caves Road, Suite 220 Austin, Texas 78746 Phone: (512) 391-0197 Email: mklatt@grsm.com Counsel for Defendant Sprout Foods Inc.</p> <p>5 6 7 8 COVINGTON & BURLING LLP 9 By: Elizabeth T. Fouhey, Esq. One City Center, 850 Tenth Street, NW Washington, D.C. 20001 Phone: (202) 662-5607 Email: efouhey@cov.com Counsel for Defendant Hain Celestial Group, Inc.</p> <p>10 11 12 DECHERT LLP 13 By: Will W. Sachse, Esq. Cira Centre, 2929 Arch Street Philadelphia, Pennsylvania 19104 Phone: (215) 994-4000 Email: will.sachse@dechert.com Counsel for Defendant Plum, PBC</p> <p>14 15 16 17 18 19 20 21 22 23 24 25</p> <p>POLSINELLI By: Whitney Mayer, Esq. (Zoom) 1717 Arch Street, Suite 2800 Philadelphia, Pennsylvania 19103 Phone: (215) 267-3051 Email: wmayer@polsinelli.com Counsel for Defendant Neptune Wellness Solutions, Inc.</p> <p>DLA PIPER LLP (US) By: Noorvik Minasian, Esq. (Zoom) 2000 Avenue of the Stars, Suite 400 North Tower Los Angeles, California 90067 Phone: (310) 595-3142 Email: noorvik.minasian@dlapiper.com Counsel for Defendant Nurture, LLC</p>	<p style="text-align: center;">Page 4</p> <p>1 APPEARANCES (Continued) 2 3 DLA PIPER (US) 4 By: Brenna D. Kelly, Esq. (Zoom) One Liberty Place 1650 Market Street, Suite 5000 Philadelphia, Pennsylvania 19103 Phone: (215) 656-2428 Email: brenna.kelly@us.dlapiper.com Counsel for Defendant Nurture, LLC</p> <p>5 6 7 8 DAVIS WRIGHT TREMAINE LLP 9 By: P. Andrew McStay, Jr., Esq. (Zoom) By: Ashley Vulin, Esq. (Zoom) 560 SW 10th Avenue, Suite 700 Portland, Oregon 97205 Phone: (503) 778-5302 Email: andymcstay@dwt.com Email: ashleyvulin@dwt.com Counsel for Defendant Amazon.com Services LLC</p> <p>10 11 12 13 14 KING & SPALDING LLP 15 By: Carmen Toledo, Esq. (Zoom) 1180 Peachtree Street, NE, Suite 1600 Atlanta, Georgia 30309 Phone: (404) 572-3438 Email: ctoledo@kslaw.com Counsel for Defendants Beech-Nut Nutrition Company and Walmart Inc.</p> <p>16 17 18 19 20 21 22 23 24 25</p> <p>Also Present: Gil Whitney, Videographer</p>

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<p style="text-align: right;">Page 9</p> <p>1 haven't you?</p> <p>2 A. I have.</p> <p>3 Q. I just want to give you a few reminders.</p> <p>4 I'm sure you know these things.</p> <p>5 Is there any reason here today that you</p> <p>6 can't give full, truthful, and complete answers,</p> <p>7 whether it's due to medications, any stressful</p> <p>8 events in your life, anything else going on?</p> <p>9 A. No.</p> <p>10 Q. Okay. You understand we can take a break</p> <p>11 anytime you need one as long as there's not a</p> <p>12 question pending?</p> <p>13 A. Yes, I do.</p> <p>14 Q. And the court reporter would appreciate</p> <p>15 and I would appreciate if you could give verbal</p> <p>16 answers rather than "uh-huhs" or "mm-hmms." I'll</p> <p>17 try to remember to correct you if you do that.</p> <p>18 I've read your testimony in the past. It</p> <p>19 doesn't seem like that's a problem, but if you</p> <p>20 could just keep that in mind that would be great.</p> <p>21 A. Sure. I've gotten a little bit better</p> <p>22 over time, but I'm not perfect with that.</p> <p>23 Q. Try not to get in a hurry. If you would,</p> <p>24 let me finish my question before you start your</p> <p>25 answer, and I will try to let you finish your</p>	<p style="text-align: right;">Page 10</p> <p>1 answer before I start my question, next question,</p> <p>2 if that's okay.</p> <p>3 A. Sounds good.</p> <p>4 Q. But in fairness, if you would give</p> <p>5 responsive answers, I think the day will go</p> <p>6 quicker and also that will avoid us having to</p> <p>7 repeat questions and things like that. Is that</p> <p>8 fair?</p> <p>9 A. Yes.</p> <p>10 Q. Okay. Thank you. And of course, if you</p> <p>11 don't understand my question -- and that's very</p> <p>12 possible -- please let me know and I'll be happy</p> <p>13 to rephrase it so you can understand it. Is that</p> <p>14 fair?</p> <p>15 A. Yes, I will.</p> <p>16 Q. Okay. I count that you've given at least</p> <p>17 five previous depositions before your deposition</p> <p>18 here today. And I'll just tick them off and then</p> <p>19 ask you if there are any others.</p> <p>20 I have an indication that you gave two</p> <p>21 depositions in the NC versus Hain case in</p> <p>22 California state court, one in December 2021 and</p> <p>23 one in April of 2023. Does that sound correct?</p> <p>24 A. I don't remember exactly how many. That</p> <p>25 sounds farther in the past than I would have</p>
<p style="text-align: right;">Page 11</p> <p>1 guessed, but I don't know exactly when the dates</p> <p>2 were. I don't know if it's exactly -- if it's two</p> <p>3 or one or three.</p> <p>4 Q. And I know that it's been a while since</p> <p>5 you were deposed in that case, but does it seem</p> <p>6 accurate that you gave two depositions in the</p> <p>7 case?</p> <p>8 A. Yeah. So there was a -- was it the Sargon</p> <p>9 hearing? I don't know if that counts.</p> <p>10 Q. Well, I was going to come to that in a</p> <p>11 minute. I was just asking you about depositions</p> <p>12 right now.</p> <p>13 A. I don't recall exactly how many there</p> <p>14 were. Two sounds fair.</p> <p>15 Q. Okay. I have noted that you gave a</p> <p>16 deposition in a case called In Re Plum Baby Food</p> <p>17 Litigation in Northern California federal court.</p> <p>18 Does that sound fair?</p> <p>19 A. Is that -- there's a class action? Yeah.</p> <p>20 I think I've given a few on the class action at</p> <p>21 this point.</p> <p>22 I know there was one in person. There was</p> <p>23 one on Zoom. So I can -- I think that the one in</p> <p>24 person was the class action. I think there have</p> <p>25 been at least two.</p>	<p style="text-align: right;">Page 12</p> <p>1 Q. Okay. Also indication that you've given a</p> <p>2 deposition in Abbott Infant Formula Products</p> <p>3 Liability Litigation. Do you remember that?</p> <p>4 A. Maybe that was the one that was in person.</p> <p>5 Maybe I'm getting confused. Maybe the Plum was on</p> <p>6 Zoom and the Abbott one was in person, now that</p> <p>7 you say that.</p> <p>8 Q. Do you recall the subject of your</p> <p>9 testimony in the Abbott infant formula case?</p> <p>10 A. They've all been about heavy metals in</p> <p>11 baby food products.</p> <p>12 Q. Or in that case, it was infant formula?</p> <p>13 A. Yeah. Sorry. I was including infant</p> <p>14 formula in my characterization of baby foods.</p> <p>15 Q. And then I know in March of this year,</p> <p>16 March 6th, 2025, you gave a deposition in the</p> <p>17 Landon R. case in California state court. Do you</p> <p>18 recall that?</p> <p>19 A. Yes. Here. That was the one that was</p> <p>20 here.</p> <p>21 Q. You're talking about here at the DLA --</p> <p>22 A. In this room.</p> <p>23 Q. I'm sorry. We're talking over each other.</p> <p>24 You had given a deposition in the</p> <p>25 Landon R. case in this exact location in</p>

<p style="text-align: right;">Page 13</p> <p>1 March 2025. Is that correct?</p> <p>2 A. That is correct.</p> <p>3 Q. And we're talking about the DLA office</p> <p>4 here in Boston?</p> <p>5 A. Yes.</p> <p>6 Q. Do you live in Boston?</p> <p>7 A. I live in the suburbs of Boston.</p> <p>8 Q. Which suburb?</p> <p>9 A. I live in Medfield, Massachusetts.</p> <p>10 Q. Okay. Do you recall any other depositions</p> <p>11 you've given other than the ones we've just</p> <p>12 enumerated?</p> <p>13 A. There was a -- I had a little deposition</p> <p>14 for a private matter in probably 2019 regarding a</p> <p>15 sort of, like, real estate land dispute in my</p> <p>16 neighborhood.</p> <p>17 Q. That's the only other one that you have</p> <p>18 given?</p> <p>19 A. I don't remember exactly. Like, I can't</p> <p>20 say for sure that your counts were correct, but I</p> <p>21 can't think of any other ones, off the top of my</p> <p>22 head.</p> <p>23 Q. And let me go back because a minute ago</p> <p>24 you mentioned about testifying at a Sargon hearing</p> <p>25 in the NC case, I believe.</p>	<p style="text-align: right;">Page 14</p> <p>1 A. I think it was that case.</p> <p>2 Q. And that was a baby foods case. Correct?</p> <p>3 A. That is correct.</p> <p>4 Q. You testified remotely in that?</p> <p>5 A. I did.</p> <p>6 Q. As opposed to being actually in court.</p> <p>7 Correct?</p> <p>8 A. That is correct.</p> <p>9 Q. And that was just testimony with the</p> <p>10 lawyers and the judge involved? There was no jury</p> <p>11 involved in that?</p> <p>12 A. I don't recall there being a jury.</p> <p>13 Q. Have you ever given testimony in a</p> <p>14 courtroom where there was a jury?</p> <p>15 A. I have never given testimony in a</p> <p>16 courtroom with a jury.</p> <p>17 Q. Okay.</p> <p>18 MR. KLATT: Let's mark as the first</p> <p>19 exhibit to your deposition. If we could mark this</p> <p>20 as Exhibit Number 1.</p> <p>21 (Exhibit 1 marked for identification)</p> <p>22 MR. KLATT: Pedram, it's just the notice.</p> <p>23 A. I was scared you were going to have some</p> <p>24 proof that somehow I had been in a court with a</p> <p>25 jury. I was curious to see how bad my memory</p>
<p style="text-align: right;">Page 15</p> <p>1 really was.</p> <p>2 MR. ESFANDIARY: The crux of the case.</p> <p>3 Q. I didn't think you had, but I just wanted</p> <p>4 to make sure.</p> <p>5 A. No.</p> <p>6 Q. We're showing you what's been marked as</p> <p>7 Exhibit Number 1 to your deposition, Dr. Gardener,</p> <p>8 and it's "Defendants' Notice of Deposition of</p> <p>9 Hannah Gardener, Sc.D. and Request for Production</p> <p>10 of Documents."</p> <p>11 Have you seen Exhibit 1 before you came</p> <p>12 here today?</p> <p>13 A. Sorry. I need to get acquainted.</p> <p>14 Q. Sure.</p> <p>15 A. Is this something from the past, from --</p> <p>16 Q. No. This is something that was served in</p> <p>17 this case -- just turn to the back -- just a</p> <p>18 couple of weeks ago, on July 14th.</p> <p>19 I gather you haven't seen that before</p> <p>20 today?</p> <p>21 A. I think I have, but I figured I -- the</p> <p>22 most responsible thing would be to read it.</p> <p>23 Q. I'll just represent to you if you've seen</p> <p>24 it, it is the notice. There's nothing new there.</p> <p>25 MR. KLATT: Pedram, let's go off the</p>	<p style="text-align: right;">Page 16</p> <p>1 record if she's going to take some time to review</p> <p>2 that.</p> <p>3 MR. ESFANDIARY: Sure.</p> <p>4 THE VIDEOGRAPHER: We're off the record,</p> <p>5 9:19 a.m.</p> <p>6 (Off the record, 9:19 a.m. to 9:20 a.m.)</p> <p>7 THE VIDEOGRAPHER: Back on the record,</p> <p>8 9:20 a.m. Please proceed.</p> <p>9 BY MR. KLATT:</p> <p>10 Q. So, Dr. Gardener, I think during our brief</p> <p>11 break off the record you established you have seen</p> <p>12 Exhibit Number 1 before today. Correct?</p> <p>13 A. I believe so. Like I said when we were</p> <p>14 off the record, I thought more recently than</p> <p>15 July 14th. I haven't taken the time to read it</p> <p>16 all, so I can't verify that it's different from</p> <p>17 what I'm familiar with.</p> <p>18 Q. When you reviewed it previously, did you</p> <p>19 identify any documents you had that were</p> <p>20 responsive to the notice?</p> <p>21 A. Yes.</p> <p>22 Q. Did you bring any of those with you today?</p> <p>23 A. No.</p> <p>24 Q. What did you identify that was responsive</p> <p>25 to the notice?</p>

<p style="text-align: center;">Page 17</p> <p>1 MR. ESFANDIARY: Without disclosing 2 attorney ex parte communications.</p> <p>3 Q. Whenever I ask you a question today, I'm 4 not asking you for the substance of any 5 communications you've had with the plaintiff's 6 attorney. I might ask you who you've talked to, 7 but I won't ask you the substance.</p> <p>8 If you would, identify what materials you 9 have that are responsive to Exhibit Number 1.</p> <p>10 A. Sure. So in response to this, I sent my 11 CV to my lawyer. I expect they sent it to you.</p> <p>12 Q. Yes. We'll mark that in a minute.</p> <p>13 Go ahead.</p> <p>14 A. And then I asked questions about --</p> <p>15 MR. ESFANDIARY: Don't reveal any 16 communications with attorneys.</p> <p>17 Q. Other than your CV, did you have materials 18 responsive to the request in Exhibit 1?</p> <p>19 A. No. I mean, I'm a professor of 20 biostatistics. There was a request for, like, 21 anything I've ever done about biostatistics, which 22 would be, like, too vast and unreasonable to 23 provide everything I've ever discussed about 24 biostatistics. I discuss it every single day in 25 my career for 18 years. But I had nothing to</p>	<p style="text-align: center;">Page 18</p> <p>1 produce that was related to this case.</p> <p>2 Q. All right. Well, let's go to the actual 3 page Number 4 in Exhibit Number 1. And you'll see 4 Request For Production No. 1, it doesn't ask you 5 for anything you've ever written. It asked you 6 for your file in this case, including published 7 and unpublished literature.</p> <p>8 Do you have such a file?</p> <p>9 A. I don't know what you mean by "file."</p> <p>10 Q. Do you have any materials relating to this 11 case?</p> <p>12 A. Sure.</p> <p>13 Q. Okay. So that would be your file. 14 And where do you keep that?</p> <p>15 A. On my computer.</p> <p>16 Q. Okay. Did you bring that with you today?</p> <p>17 A. I did not.</p> <p>18 Q. Okay. Look at Request No. 2, "All 19 document(s) setting forth or referring to, in 20 whole or in part, the data or other information" 21 you considered "to prepare your opinions in this 22 case."</p> <p>23 Do you have such documents?</p> <p>24 A. Yes. There's a long list of, like, 25 reference material that I have sort of added over</p>
<p style="text-align: center;">Page 19</p> <p>1 the years. And my understanding is that the 2 lawyers in this case have a long record of that 3 and have shared that with you.</p> <p>4 Q. Okay. Let's look at Request No. 4, "All 5 document(s) reflecting unpublished data, including 6 but not limited to your own data reviewed by or 7 relied upon by you to provide the opinions offered 8 in this case."</p> <p>9 Do you have any such unpublished data?</p> <p>10 A. I have no unpublished data related to 11 opinions in this case that -- that formed my 12 opinions in this case.</p> <p>13 Years ago I published a paper on heavy 14 metal contamination in baby food that -- we 15 published it on lead and cadmium, but we also did 16 analyze data on arsenic and mercury.</p> <p>17 So I guess that would be -- I have 18 knowledge of contamination of baby food with 19 arsenic from that work.</p> <p>20 Q. And you said you published a paper 21 resulting from that?</p> <p>22 A. That is correct.</p> <p>23 Q. And did you conclude in that paper that 24 arsenic in baby food caused autism?</p> <p>25 A. So in that paper we did not include</p>	<p style="text-align: center;">Page 20</p> <p>1 arsenic. So in that paper we included cadmium and 2 lead. We did not publish our findings for arsenic 3 and mercury.</p> <p>4 Q. Did you conclude in that paper that any 5 heavy metal caused autism, ASD, autism spectrum 6 disorder or ADHD?</p> <p>7 A. So in that paper we were looking at heavy 8 metal contamination in baby food. We studied -- I 9 can't remember how many samples. It was like 10 between over a hundred, I want to say, different 11 baby food samples.</p> <p>12 We measured the contamination in those 13 baby food samples with lead and cadmium. There 14 were no people in that study, so there were no -- 15 there were no children, there were no adults. We 16 were looking at the extent of contamination of 17 that baby food with lead and cadmium.</p> <p>18 We also did analyze arsenic and mercury, 19 but we did not publish the results for arsenic and 20 mercury.</p> <p>21 So I do have that data on arsenic and 22 mercury, actually probably on an old computer 23 because now that was really a long time ago that 24 we analyzed that data.</p> <p>25 Q. So in answer to my question, you did not</p>

<p style="text-align: right;">Page 21</p> <p>1 conclude in that published paper that lead, 2 cadmium, arsenic, or mercury caused autism, autism 3 spectrum disorder or attention deficit 4 hyperactivity disorder. Correct?</p> <p>5 A. That paper was not related to that. That 6 paper was all about how heavily contaminated baby 7 food is with lead and cadmium.</p> <p>8 Q. And you didn't draw any conclusions about 9 the health outcomes as a result of that, in that 10 paper. Correct?</p> <p>11 A. I'd have to look at the paper. I'm 12 assuming you have it. But in terms of what we 13 wrote in the discussion, I don't recall our 14 discussion in -- what we wrote in the discussion 15 about the implications of that high level of 16 contamination.</p> <p>17 Q. Let's -- just so we're clear today, let's 18 get a few terms defined.</p> <p>19 If I use "ASD," can we agree I'm referring 20 to autism spectrum disorder?</p> <p>21 A. Yes, I understand that.</p> <p>22 Q. If I say "ADHD," we're referring to 23 attention deficit hyperactivity disorder?</p> <p>24 A. Yes, I understand that.</p> <p>25 Q. Let's continue looking at Exhibit</p>	<p style="text-align: right;">Page 22</p> <p>1 Number 1, Request 5, "All document(s) 2 constituting, setting forth, referring to, in 3 whole or in part, exhibits to be used as a summary 4 or support for your opinions, which you prepared."</p> <p>5 Do you have any such thing?</p> <p>6 A. "All documents constituting, setting 7 forth, or referring to, in whole or in part, 8 exhibits" -- that's a mouthful of a sentence for a 9 nonlawyer -- "exhibits to be used as a summary of 10 or support of your opinions."</p> <p>11 Meaning, like, the papers?</p> <p>12 Q. Whatever --</p> <p>13 A. I guess I don't know what the question is here.</p> <p>14 Q. Have you created any exhibits to be used as part of your opinions or testimony in the case?</p> <p>15 A. I'm not exactly sure exactly what constitutes an exhibit, but I created a report. And that report --</p> <p>16 MR. KLATT: Let's mark that. (Exhibit 2 marked for identification)</p> <p>17 Q. Do you recognize what we've marked as 18 Exhibit 2, Dr. Gardener?</p> <p>19 MR. ESFANDIARY: Do you have a copy for me, Mike?</p>
<p style="text-align: right;">Page 23</p> <p>1 MR. KLATT: You know what, I don't. I'm 2 sorry.</p> <p>3 MR. ESFANDIARY: I can bust out my 4 computer here.</p> <p>5 A. This looks like my report.</p> <p>6 Q. Your report in this case, in the baby food 7 MDL?</p> <p>8 A. Yes.</p> <p>9 Q. And I believe the date of that report is 10 May 23rd, 2025. Is that correct?</p> <p>11 A. That is correct. That's on here.</p> <p>12 Q. I know you prepared reports in previous 13 baby food cases, in the NC case and in the 14 Landon R. case. Do you remember those reports?</p> <p>15 A. Yes. And it's really hard for me to keep 16 them all, like, which one is which. But there's 17 also -- I've prepared reports on heavy metal 18 contamination in class action lawsuits as well.</p> <p>19 Q. I'm specifically asking about the cases in 20 which it's alleged that heavy metals caused or 21 contributed to ASD or ADHD.</p> <p>22 And my understanding is you've written 23 reports in the NC case, in the Landon R. case, and 24 in this case, the baby food MDL. Is that correct?</p> <p>25 A. That is correct. But also in multiple</p>	<p style="text-align: right;">Page 24</p> <p>1 class action lawsuits. Those are broader in terms 2 of my responsibility wasn't just ASD and ADHD but 3 also other outcomes. But ASD and ADHD were in 4 those reports. That's why I think it's probably 5 most responsible for me to include those as well.</p> <p>6 Q. Did you -- do you recall needing to go 7 back and correct anything that you wrote in your 8 report either in the NC case or in the Landon R. 9 case?</p> <p>10 A. Yeah. There was one sentence that I 11 needed to, like -- there was a sentence that 12 didn't sound right. I don't remember exactly what 13 sentence it was. I corrected it at one of the 14 depositions. Like, the sentence didn't make 15 sense. It's correct in here.</p> <p>16 But other than that, I don't recall any 17 other corrections nor do I remember what sentence 18 it was.</p> <p>19 Q. Do you remember whether that was in the NC 20 or the Landon R. case?</p> <p>21 A. Actually, now that I am thinking about it, 22 I corrected it in the deposition that was taken by 23 Zoom, which would have been in one of the class 24 action cases.</p> <p>25 But actually, I think that sentence had</p>

<p style="text-align: center;">Page 25</p> <p>1 been in -- so I don't think -- maybe it was never 2 actually corrected on the record. It was, like -- 3 it was supposed to say "do not" and it was -- it 4 was like a sentence that didn't make sense.</p> <p>5 But now that I think about it, that 6 sentence might have actually been in the 7 earlier -- in the earlier reports, but the 8 correction was made in the class action lawsuit.</p> <p>9 But there was some overlap between, you 10 know -- I copied and pasted some things that 11 applied because in the class action lawsuits I 12 talk about sort of the broad health effects of the 13 contamination of baby food with heavy metal.</p> <p>14 So in sections where I talked about ASD 15 and ADHD, I didn't reinvent the wheel; I copied 16 and pasted. So I think that sentence might have 17 been in one of the earlier reports.</p> <p>18 Q. So as we sit here today, is there anything 19 else that you can recall from either the NC report 20 you wrote or the Landon R. report you wrote that 21 you would want to correct or change today?</p> <p>22 A. Not that I can think of.</p> <p>23 Q. Okay.</p> <p>24 MR. KLATT: Let's mark the next exhibit. 25 (Exhibit 3 marked for identification)</p>	<p style="text-align: center;">Page 26</p> <p>1 Q. The court reporter has handed you what 2 we've marked as Exhibit Number 3. Dr. Gardener, 3 do you see that?</p> <p>4 A. Yes, I do.</p> <p>5 Q. And what is Exhibit Number 3?</p> <p>6 A. It looks like my reference list.</p> <p>7 Q. And it's also -- if you look at the cover 8 page, it says "Rebuttal Expert Report of Hannah 9 Gardener." Correct?</p> <p>10 A. Yes.</p> <p>11 Q. And it's dated July 15th, 2025, just a 12 little over two weeks ago. Correct?</p> <p>13 A. Correct.</p> <p>14 Q. What's your understanding of the purpose 15 of your writing a rebuttal report in the case?</p> <p>16 A. So, like, the rebuttal was indicating that 17 I had not -- that none of my opinions were changed 18 after seeing some slight -- slightly different 19 estimates from the toxicologists in this case 20 about the levels of lead and arsenic in 21 hypothetical menus of baby foods related to this 22 case.</p> <p>23 Q. You're referring to menus for which 24 Dr. Jones calculated heavy metal levels. Is that 25 correct?</p>
<p style="text-align: center;">Page 27</p> <p>1 A. That is correct.</p> <p>2 Q. Do you know Dr. Jones personally?</p> <p>3 A. I do not.</p> <p>4 Q. Did you try to, yourself, verify any of 5 the data that she reported?</p> <p>6 A. I did not.</p> <p>7 Q. You relied totally on her calculations. 8 Is that correct?</p> <p>9 A. I relied on her calculations for what they 10 were, for the amount of arsenic and lead in these 11 hypothetical baby food menus across different 12 brands of baby food.</p> <p>13 Q. So you don't know Dr. Jones personally. 14 Correct?</p> <p>15 A. I do not. I don't know anything about 16 Dr. Jones. I've never met Dr. Jones.</p> <p>17 Q. Do you know what Dr. Jones' field of 18 expertise is?</p> <p>19 A. My understanding -- I'm not even sure if 20 Dr. Jones is a he or she. My understanding is 21 that Dr. Jones is a toxicologist, and that is 22 about all I know about Dr. Jones.</p> <p>23 Q. Are you sure about her being a 24 toxicologist?</p> <p>25 A. I'm not even sure about the "her." I have</p>	<p style="text-align: center;">Page 28</p> <p>1 been told that Dr. Jones is a toxicologist.</p> <p>2 Q. And I'll represent to you as far as I know 3 she is a woman as well. So you can assume that.</p> <p>4 A. Okay. Then I'll refer to her as "she."</p> <p>5 Q. Was there anything else that you intended 6 to do with your rebuttal report other than just 7 discuss the revised numbers that Dr. Jones 8 provided?</p> <p>9 A. No. That is all I did in my rebuttal 10 report.</p> <p>11 Q. And also attached to your rebuttal report 12 is an updated materials considered list of 13 Dr. Hannah Gardener. Do you see that?</p> <p>14 A. Yes, I do.</p> <p>15 Q. And is this the list you prepared and 16 provided to attorneys?</p> <p>17 A. I have not prepared this list --</p> <p>18 Q. Okay.</p> <p>19 A. -- and I have never provided it. What has 20 happened is over time the lawyers in this case 21 have really taken the responsibility for creating 22 and maintaining this spreadsheet.</p> <p>23 I basically -- my relationship with the 24 lawyers in this case and in related cases has now 25 been over several years. And every time I sort of</p>

<p style="text-align: center;">Page 29</p> <p>1 write a report or work on this more, I increase 2 the number of articles that I tell them that I 3 have read and cited in the report that contribute 4 to my opinions.</p> <p>5 And they keep this list of everything that 6 I have read.</p> <p>7 Like, I cannot say for sure that there are 8 things that I have read that are not in this list. 9 There probably are, because I read things, you 10 know, all the time that contribute to my general 11 understanding of epidemiology and neurotoxicity, 12 nor can I say that there's anything --</p> <p>13 Q. I understand that. But what I'm asking 14 you, when is the last time that you verified the 15 accuracy of the updated materials considered list 16 of Dr. Hannah Gardener that has been marked as 17 part of Exhibit 3?</p> <p>18 A. I have never, like, gone through this, you 19 know, really carefully and made sure that it's 20 super correct. I basically tell the lawyers, 21 like, you know, iteratively throughout the whole 22 process, these are all the papers that I have 23 read. But I've never -- I don't have a 24 spreadsheet to verify it off of.</p> <p>25 Q. Have you gone back at any time to verify</p>	<p style="text-align: center;">Page 30</p> <p>1 that, in fact, you've read every article that's 2 listed in Exhibit 3?</p> <p>3 A. If I did, I -- I mean, there are 556 4 articles. So I can guarantee you that there are 5 articles in this list that I have read, if I 6 looked at it, I wouldn't recognize it.</p> <p>7 A few days ago I was reading a paper and I 8 was like, wow, this is a really great paper. And 9 I looked up and I saw I was an author on it many 10 years ago.</p> <p>11 So as you can see, I have published, you 12 know, over 140 papers. I read papers all day, 13 every day. I cannot possibly remember every 14 single paper I have read.</p> <p>15 So I guarantee you if I saw a paper, if 16 you handed me some of these papers, I wouldn't -- 17 it would be as if I was reading it anew. I 18 wouldn't recall it easily.</p> <p>19 Q. But are you representing to us that you 20 have read and reviewed every paper listed in 21 Exhibit 3 at some point in time?</p> <p>22 A. Most likely. Like, you know, I can't 23 say -- my understanding is that this is a list 24 that the lawyers for the plaintiff --</p> <p>25 THE WITNESS: Is that right?</p>
<p style="text-align: center;">Page 31</p> <p>1 A. -- the lawyers for the plaintiff have 2 accumulated based on what I have told them that I 3 have read.</p> <p>4 Is it possible that there's a paper that I 5 read that I forgot over so many years to tell them 6 about? Possibly. I don't actually think that 7 there's any papers that they think I have read 8 that I haven't actually read.</p> <p>9 Q. But it's accurate, you haven't gone back 10 through to verify that you've read every paper 11 that you've listed in Exhibit 3. Correct?</p> <p>12 A. That is correct. I don't have a list to 13 compare it to. I have never done any -- spent any 14 time systematically reviewing this list for its 15 accuracy.</p> <p>16 Q. Do you know whether you've ever removed 17 any references that were in a previous materials 18 considered list in --</p> <p>19 A. Not that --</p> <p>20 Q. I'm talking about either for the NC case, 21 the Landon R. case or this case.</p> <p>22 A. Not that I can recall ever seeing.</p> <p>23 I think what you're asking is have I ever 24 seen a list on here and said, "Oh, no, I haven't 25 read that" and removed it. I can't recall doing</p>	<p style="text-align: center;">Page 32</p> <p>1 that.</p> <p>2 Q. Or that you read it but thought it's 3 something you no longer rely on. Have you done 4 that?</p> <p>5 A. Well, I guess my understanding is that 6 I -- it's hard to say what I rely on versus what I 7 don't.</p> <p>8 I feel like everything I've ever read in 9 my brain is sort of in there when I'm creating 10 this report.</p> <p>11 And to be honest, the list is probably 12 bigger if you think about the fact that when I 13 think about these papers I think about them from a 14 statistical standpoint. And so therefore, in 15 doing that, I rely on textbooks from my years at 16 Harvard. I rely on statistical papers that I read 17 at Harvard and throughout my entire career.</p> <p>18 Q. Understood.</p> <p>19 MR. ESFANDIARY: Don't interrupt.</p> <p>20 MR. KLATT: I just would like her to 21 answer the question I asked.</p> <p>22 MR. ESFANDIARY: I know. But, Mike, I 23 think we have an agreement -- actually, it's on 24 the record that you-all would stop interrupting 25 witnesses.</p>

<p style="text-align: right;">Page 33</p> <p>1 MR. KLATT: But we need responsive 2 answers, in the interest of time.</p> <p>3 MR. ESFANDIARY: She's being responsive.</p> <p>4 MR. KLATT: Well, Pedram, my specific 5 question was has she ever removed an article from 6 the materials considered.</p> <p>7 MR. ESFANDIARY: She was in the middle of 8 responding to that question.</p> <p>9 MR. KLATT: Talking about everything she's 10 reviewed in her career.</p> <p>11 MR. ESFANDIARY: Yeah, because she is a 12 scientist with a very long background.</p> <p>13 MR. KLATT: I understand. But let's -- my 14 specific question --</p> <p>15 MR. ESFANDIARY: I know, I know. 16 Mike, please don't interrupt me.</p> <p>17 You asked her a question and she was in 18 the middle of responding to it and you interrupted 19 her. So please stop doing that.</p> <p>20 And, Doctor, feel free to give complete 21 answers.</p> <p>22 MR. KLATT: Complete but responsive 23 answers. Yes.</p> <p>24 MR. ESFANDIARY: Go ahead and reask your 25 question.</p>	<p style="text-align: right;">Page 34</p> <p>1 BY MR. KLATT: 2 Q. Let me reask my question. It's a very 3 specific question. Do you recall ever removing an 4 article from either this materials considered list 5 or a previous materials considered list in either 6 the NC or the Landon R. case?</p> <p>7 MR. ESFANDIARY: You can answer again. 8 A. So I apologize, I thought that was 9 actually two questions ago, and I thought I had 10 answered that. And then I thought there was a new 11 question on the record that I was answering.</p> <p>12 Q. Can you answer this one? 13 A. Yes. So going back to that question, like 14 I said before, I don't recall ever seeing a paper 15 in this list either now or in the past and saying, 16 "Oh, wait, I haven't -- I didn't actually read 17 that" and removing it. I don't recall ever doing 18 it.</p> <p>19 Q. And you also don't recall going back and 20 saying, "Oh, I don't rely on that paper anymore so 21 I'm going to take it off the list"?</p> <p>22 A. I think that was the second question that 23 I thought was the answer.</p> <p>24 In creating this report, I relied on 25 everything that I have read about this matter. So</p>
<p style="text-align: right;">Page 35</p> <p>1 my understanding is that everything that 2 contributes that I have read about this topic I'm 3 supposed to include in here.</p> <p>4 Some of those papers are not cited to. I 5 think what you're saying is when you rely on them, 6 are they cited to your report.</p> <p>7 My understanding is there are some papers 8 in here that I have read, that I have considered, 9 but they're not cited to in my report.</p> <p>10 In my report, the ones I have cited to 11 would be the ones I relied on, I would say.</p> <p>12 Q. Let me follow up on a very specific 13 question I have.</p> <p>14 In looking at these lists of materials 15 considered, either whether it was in the NC case, 16 the Landon R. case, or this case, have you ever 17 looked and seen a reference in the list, one or 18 more, that you say, "You know what, I don't rely 19 on that anymore. I'm removing it from the list."</p> <p>20 That's my very specific question.</p> <p>21 MR. ESFANDIARY: Objection. I think --</p> <p>22 Q. Not what you did rely on. Whether there's 23 something that you identified and removed that you 24 no longer rely on.</p> <p>25 MR. ESFANDIARY: Objection. I think the</p>	<p style="text-align: right;">Page 36</p> <p>1 question has been asked and answered. 2 But you can answer it again.</p> <p>3 A. I guess I'm not really clear, then, on 4 sort of what the definition of "relied" -- I have 5 to think about this.</p> <p>6 Q. Okay. I'll withdraw that question.</p> <p>7 MR. ESFANDIARY: Hold on. She was in the 8 middle of responding to your question.</p> <p>9 Please go on.</p> <p>10 A. I don't even actually think that there's 11 any papers that I cited that then I removed that 12 citation in my report. So I can't think of an 13 example of something where I was like, oh, this 14 contributed to my understanding of this field of 15 science and it no longer contributes to it.</p> <p>16 Like, I don't recall any example in terms 17 of what you're asking about.</p> <p>18 Q. That's the answer to my question. Thank 19 you.</p> <p>20 Let's go back to Exhibit 2, which is your 21 report in this case. Correct?</p> <p>22 A. Yes. That's correct.</p> <p>23 Q. Did anyone assist you in writing this 24 report?</p> <p>25 MR. ESFANDIARY: Objection to the extent</p>

<p style="text-align: center;">Page 37</p> <p>1 it calls for attorney-expert communications. 2 I would instruct you to not disclose 3 those. But if you can testify independent of 4 that, feel free to do so.</p> <p>5 A. The writing is mine, the opinions are all 6 mine, but I have had help -- a lot of help over 7 time in terms of formatting it.</p> <p>8 Like the format, the required formats have 9 changed between cases. There have been sort of 10 suggestions in terms of -- I guess the word is 11 "formatting," where to put things, how to 12 structure it.</p> <p>13 Like, there have been changes, I guess, 14 over time in terms of how the charges have been 15 communicated to me, so my writing has been 16 responsive to that.</p> <p>17 Q. Excluding any communications with 18 attorneys, has anyone else other than you assisted 19 you in writing your report in this case?</p> <p>20 A. No. Like, I haven't used any research 21 assistants or, you know, any other people.</p> <p>22 Q. You exactly anticipated my question. So 23 you have not used any research assistant, fellow, 24 graduate student, anyone else to assist you in 25 writing the report. Is that correct?</p>	<p style="text-align: center;">Page 38</p> <p>1 A. That is correct. I have not. 2 MR. KLATT: Let's mark the next exhibit. 3 (Exhibit 4 marked for identification)</p> <p>4 Q. A minute ago you mentioned, Dr. Gardener, 5 that you had provided the attorneys with an 6 updated CV. And this is what we were provided 7 recently.</p> <p>8 Is that what you were referring to, what 9 we've marked now as Exhibit 4, your CV?</p> <p>10 A. Yes. This is my updated CV that I sent 11 them last week, I think.</p> <p>12 Q. When did you update it?</p> <p>13 A. I updated it last week.</p> <p>14 Q. Do you recall what you added?</p> <p>15 A. Yup. So I can't be sure all the things I 16 added. The one that I had -- I think what they 17 had sent you, a CV from March, I want to say, was 18 the last time I had sent them a CV. And that was 19 before I was promoted to associate professor, so 20 my new CV reflects that big promotion.</p> <p>21 I'm constantly publishing. So my updated 22 CV reflects publications that are in PubMed since 23 March. My updated CV, I had a presentation this 24 week at the Alzheimer's Association International 25 Conference. I had other -- I actually had a few</p>
<p style="text-align: center;">Page 39</p> <p>1 presentations at this meeting this week, at the 2 AAIC.</p> <p>3 I had some abstracts presented at an AHA 4 meeting in March. I had a bunch of -- from 5 February -- actually, those ones probably had 6 already been in there.</p> <p>7 The American Academy of Neurology meeting 8 was in April. I included the abstract that I 9 presented there.</p> <p>10 Q. What was that abstract on?</p> <p>11 A. Outcomes of reperfusion therapies for 12 acute ischemic stroke in patients with preexisting 13 dementia.</p> <p>14 Q. It's true that you've written a fair 15 amount on stroke. Correct?</p> <p>16 A. Yes.</p> <p>17 Q. In terms of the presentations that you've 18 made to, I think you said, the American Academy of 19 Neurology. Correct?</p> <p>20 A. Yes.</p> <p>21 Q. You mentioned the AHA. What is that?</p> <p>22 A. The American Heart Association, which is 23 also the American Stroke Association.</p> <p>24 Q. And AAIC, what is that?</p> <p>25 A. That's the Alzheimer's Association</p>	<p style="text-align: center;">Page 40</p> <p>1 International Conference. It's going on this 2 whole week.</p> <p>3 Q. Would it be accurate to say that in 2025 4 you've made no presentations to any scientific 5 organization regarding heavy metals and autism or 6 ADHD?</p> <p>7 A. I definitely haven't done any 8 presentations this year about autism or ADHD. I 9 don't recall any about lead or arsenic either.</p> <p>10 Q. In terms of the scientific presentations 11 you've made this year, do they deal with any 12 subjects other than Alzheimer's or stroke?</p> <p>13 A. Yes.</p> <p>14 Q. What?</p> <p>15 A. So I've done a lot of presenting about 16 PFAS, per- and polyfluoroalkyl substances.</p> <p>17 Q. And what, specifically, subject were you 18 addressing with those presentations?</p> <p>19 A. The need for more research on them, study 20 on them, mostly in relation to dementia but really 21 in relation to neurological consequences of them 22 in general.</p> <p>23 Q. Can infants and children be exposed to 24 those substances?</p> <p>25 A. Yes.</p>

<p style="text-align: center;">Page 41</p> <p>1 Q. Can they have neurocognitive harm to 2 children and infants?</p> <p>3 A. From PFAS?</p> <p>4 Q. Yes.</p> <p>5 A. Yes.</p> <p>6 MR. ESFANDIARY: Belated objection. That 7 calls for an undisclosed opinion.</p> <p>8 Q. Do you believe that PFAS can cause or 9 contribute to autism or ADHD in children?</p> <p>10 MR. ESFANDIARY: Objection, beyond the 11 scope of Dr. Gardener's expert testimony in this 12 case and calls for an unsolicited opinion.</p> <p>13 Q. I'm just asking your expert opinion as 14 someone who has presented in the field.</p> <p>15 MR. ESFANDIARY: That's beyond the scope 16 of what she's here to talk about.</p> <p>17 But if you have an opinion.</p> <p>18 MR. KLATT: She can answer.</p> <p>19 A. I haven't delved into that literature 20 fully, really. My grant and my work is focused on 21 late-life cognitive impairment due to PFAS. And 22 actually, the study population that I'm working in 23 was largely not even exposed when they were very 24 young.</p> <p>25 Q. Based on what you know about PFAS, in your</p>	<p style="text-align: center;">Page 42</p> <p>1 professional activities, do you entertain the 2 possibility that they may cause or contribute to 3 autism or ADHD in children?</p> <p>4 MR. ESFANDIARY: Objection, it calls for 5 an undisclosed opinion beyond the scope of 6 Dr. Gardener's expert report and opinions in this 7 case.</p> <p>8 A. So I want to take a minute and say that I 9 gave an oath at the beginning, starting this 10 morning, that -- and I take that really seriously 11 in terms of talking here about things that I am 12 very confident based on my -- what I have read and 13 prepared for today.</p> <p>14 And I don't want to be providing opinions 15 on matters that I can't confidently provide that 16 oath for. I did not come here today prepared to 17 talk about PFAS in relation to autism and ADHD.</p> <p>18 I probably could give that oath today, 19 talking about PFAS and dementia.</p> <p>20 You know, I didn't come here necessarily 21 prepared to do that, but I have so much sort of 22 very recent expertise in that that if you wanted 23 to ask me questions about PFAS in relation to 24 late-life cognitive decline, I would feel 25 confident, the way I feel confident here talking</p>
<p style="text-align: center;">Page 43</p> <p>1 about lead and arsenic in relation to ASD and 2 ADHD.</p> <p>3 But I am not prepared to provide any sort 4 of reliable opinions under oath about PFAS and 5 ADHD.</p> <p>6 Q. You hold yourself out as an expert in diet 7 and other environmental causes of neurologic 8 diseases. Correct?</p> <p>9 A. I do.</p> <p>10 Q. So I understand that with respect to 11 different subjects you may be at different places 12 along the continuum of scientific knowledge and 13 confidence.</p> <p>14 But as someone who purports to be an 15 expert in that field, are you at least 16 entertaining the hypothesis as a scientist that 17 PFAS might cause or contribute to autism or ADHD?</p> <p>18 MR. ESFANDIARY: Objection.</p> <p>19 This has gone as far as it should. I'm 20 going to instruct you not to answer that question.</p> <p>21 MR. KLATT: That's not --</p> <p>22 MR. ESFANDIARY: Take it up with Corley.</p> <p>23 MR. KLATT: I'm sorry?</p> <p>24 MR. ESFANDIARY: Take it up with Judge 25 Corley.</p>	<p style="text-align: center;">Page 44</p> <p>1 MR. KLATT: I will.</p> <p>2 Q. I'm not asking you to disclose any 3 litigation opinions. I'm asking you to disclose 4 hypotheses, thoughts, concepts that you'd 5 entertained as a scientist who has worked in the 6 field.</p> <p>7 Have you entertained the hypothesis, as a 8 scientist who's an expert on diet and other 9 environmental causes for neurologic diseases, that 10 PFAS might potentially cause ASD or ADHD in young 11 children and infants?</p> <p>12 MR. ESFANDIARY: Objection, beyond the 13 scope of Dr. Gardener's expert report and 14 testimony in this case.</p> <p>15 I instruct you not to answer that 16 question.</p> <p>17 MR. KLATT: We'll have to go to the judge 18 on this and come back.</p> <p>19 MR. ESFANDIARY: Go for it.</p> <p>20 MR. KLATT: All right. What's your -- are 21 you basing that instruction on some sort of 22 privilege?</p> <p>23 MR. ESFANDIARY: No. It's the federal 24 rules of procedure on expert testimony.</p> <p>25 MR. KLATT: That's not a basis for</p>

<p style="text-align: center;">Page 45</p> <p>1 instructing a witness not to answer.</p> <p>2 MR. ESFANDIARY: Do you want to interrupt</p> <p>3 me or do you want to let me answer your question?</p> <p>4 MR. KLATT: I'll interrupt you to say</p> <p>5 that's not a basis under the federal rules, but</p> <p>6 you can go ahead and state your objection.</p> <p>7 MR. ESFANDIARY: I just want to make sure</p> <p>8 we get something straight on the record. You</p> <p>9 don't interrupt me and I don't interrupt you at</p> <p>10 all. Let's get that one straight. So when I'm</p> <p>11 speaking, afford me the --</p> <p>12 MR. KLATT: Say what you're going to say.</p> <p>13 MR. ESFANDIARY: You just did it again.</p> <p>14 Afford me the respect of finishing</p> <p>15 responding to your question.</p> <p>16 I'm basing that objection and instruction</p> <p>17 not to answer on the Federal Rules of Civil</p> <p>18 Procedure that dictate an expert's deposition</p> <p>19 testimony shall be limited to the topics on which</p> <p>20 they have been disclosed.</p> <p>21 There's ample case law on this in the</p> <p>22 Northern District of California and other</p> <p>23 jurisdictions.</p> <p>24 If you want to move to compel on that,</p> <p>25 feel free to do so. I'm going to maintain my</p>	<p style="text-align: center;">Page 46</p> <p>1 objection and instruction to the witness.</p> <p>2 MR. KLATT: It's a totally inappropriate</p> <p>3 and invalid objection, and you know it, and you're</p> <p>4 just obstructing the deposition.</p> <p>5 MR. ESFANDIARY: Okay. I disagree, but go</p> <p>6 ahead.</p> <p>7 MR. KLATT: Why don't we take a short</p> <p>8 break, if that's all right.</p> <p>9 MR. ESFANDIARY: Sure.</p> <p>10 THE VIDEOGRAPHER: This concludes Media</p> <p>11 Number 1. Going off the record, 9:58 a.m.</p> <p>12 (Recess, 9:58 a.m. to 10:10 a.m.)</p> <p>13 THE VIDEOGRAPHER: This is the beginning</p> <p>14 of Media Number 2. Going back on the record,</p> <p>15 10:10 a.m.</p> <p>16 BY MR. KLATT:</p> <p>17 Q. If we could return to your CV that you</p> <p>18 recently provided.</p> <p>19 A. Yes. Exhibit 4.</p> <p>20 Q. Exhibit 4. Thank you.</p> <p>21 I know you said a minute ago that you</p> <p>22 previously published on the subject of autism.</p> <p>23 A. Yes.</p> <p>24 Q. When is the last time you have published</p> <p>25 work on autism or ASD?</p>
<p style="text-align: center;">Page 47</p> <p>1 A. It looks like the book chapter that I was</p> <p>2 invited to write was published around 2014.</p> <p>3 Q. Have you published anything about autism</p> <p>4 or ASD since 2014?</p> <p>5 A. Not that I can recall, off the top of my</p> <p>6 head.</p> <p>7 Q. Let's talk about ADHD. Have you ever</p> <p>8 published anything on ADHD?</p> <p>9 A. Not that I can recall, off the top of my</p> <p>10 head.</p> <p>11 Q. Have you ever made a presentation to any</p> <p>12 scientific organization or body on autism or ASD?</p> <p>13 A. Yes, definitely on autism.</p> <p>14 Q. And when and where was that?</p> <p>15 A. So I've given multiple presentations early</p> <p>16 on in my career about autism to the department of</p> <p>17 pediatrics at the University of Miami, I think to</p> <p>18 the department of endocrinology at the University</p> <p>19 of Miami.</p> <p>20 Q. When would that have been, Dr. Gardener?</p> <p>21 A. I can probably find it. That was early in</p> <p>22 my career, so that would have been in 2008, maybe</p> <p>23 2009 too. I don't have all of these -- I don't</p> <p>24 have every talk that I've ever given.</p> <p>25 Q. Where are you looking?</p>	<p style="text-align: center;">Page 48</p> <p>1 A. Under "Selected Invited Talks."</p> <p>2 Q. What page is that on Exhibit 4?</p> <p>3 A. Pages -- that was listed on page 26.</p> <p>4 Q. And what on page 26 were you referring to?</p> <p>5 A. So near the top, right above "Teaching,"</p> <p>6 "Prenatal, perinatal, and neonatal risk factors</p> <p>7 for autism, University of Miami, department of</p> <p>8 pediatrics, September 2008."</p> <p>9 Q. So that was 17 years ago. Correct?</p> <p>10 A. That is correct.</p> <p>11 Q. Have you made any presentation on autism</p> <p>12 since 2008 to any scientific or educational body?</p> <p>13 A. I don't recall. I don't think so.</p> <p>14 Q. What about for ADHD? Have you made any</p> <p>15 presentation to any scientific or educational body</p> <p>16 since -- or at any time ever, really, about ADHD?</p> <p>17 A. A presentation? Not that I recall.</p> <p>18 Q. You teach at the University of Miami, but</p> <p>19 you live in Boston. Is that correct?</p> <p>20 A. That is correct.</p> <p>21 Q. Do you ever go to Miami to teach classes</p> <p>22 in person or do you do it all remotely from</p> <p>23 Boston?</p> <p>24 A. So I teach a biostatistics class and it's</p> <p>25 on Zoom. We offered to have some lectures in</p>

<p style="text-align: right;">Page 49</p> <p>1 person, and students like it by Zoom. 2 Q. Do you ever teach classes in person? 3 A. I provide lectures in person. But the 4 class that I teach and the sort of class, like, 5 invited lecturers for formal classes are all on 6 Zoom these days. 7 Q. Okay. And how long has that been the 8 case? 9 A. On Zoom? Since the pandemic. 10 Q. Prior to the pandemic, did you go teach 11 courses at the University of Miami in person? 12 A. So I had planned to -- before I moved back 13 to Boston, I sort of had planned to do a class and 14 then I moved back to Boston. 15 And it wasn't really until the pandemic 16 and, you know, how everything turned to Zoom that 17 we were able to sort of see how I could teach 18 biostatistics. 19 Q. When you said "when we moved back to 20 Boston," were you moving from Miami? 21 A. That is correct. I used to live in Miami. 22 Q. What years did you live in Miami? 23 A. I lived in Miami until I moved, towards 24 the end of 2012. 25 Q. To Boston?</p>	<p style="text-align: right;">Page 50</p> <p>1 A. Or mid 2012, to Boston. 2 Q. And how long had you lived in Miami up to 3 that time? 4 A. About six years. Six or seven years. 5 Q. And what was it that took you to Miami in 6 the first place? 7 A. My ex-husband's job was -- when I was 8 still in grad school, so we sort of moved there. 9 But I was still at Harvard, so I was sort of going 10 back and forth for a year. 11 Q. When you finished grad school, you then 12 moved permanently to Miami. Is that correct? 13 A. Well, the last year of grad school -- grad 14 school was four years. The last year of grad 15 school I would say I was in Miami just as much as 16 I was in Boston. 17 I was doing teaching assistant work, but 18 all of my research -- like, my classes had all 19 been finished. So the only really reason I needed 20 to be in Boston was to be a teaching assistant to 21 meet with professors. 22 So I would say that last year of grad 23 school I was probably in Miami just as much as I 24 was in Boston. And then I got a postdoc at the 25 University of Miami.</p>
<p style="text-align: right;">Page 51</p> <p>1 Q. What year are you referring to that you 2 were finishing up here in Boston and moving to 3 Miami? 4 A. I believe that was 2007. 5 Q. So you were in Miami basically from 2007 6 through 2012 and then moved back to Boston. Is 7 that correct? 8 A. Well, I guess it was 2006. I guess 2006 9 was when I really started living in Miami just as 10 much as living at my parents' house in Boston. 11 I sort of didn't really have a home. My 12 ex-husband was in Miami, my parents in Boston, and 13 I was sort of going back and forth doing my last 14 year. 15 And then it was 2007 that I defended and 16 graduated and started my job, my postdoc at the 17 University of Miami. I think that was September 18 of 2007, and then it was 2012 that I moved back to 19 Boston. 20 Q. Between 2007 and 2012, did you ever teach 21 any regular classes at the University of Miami? 22 A. They asked me to. We talked about it. 23 But I was sort of fully funded with research and 24 with training in my department. 25 So in terms of, like, was I teaching?</p>	<p style="text-align: right;">Page 52</p> <p>1 Yes. I had all these residents and young doctors 2 who I was training in terms of, like, epi methods, 3 biostatistics. But I wasn't teaching a formal 4 class like I have been for the past several years. 5 Q. Okay. When is the first time in your 6 career you started teaching a formal class? 7 A. Well, I was a teaching assistant when I 8 was at Harvard. That was -- those were formal 9 classes. There were several of them. And then it 10 was 2001 or -- they probably started talking to me 11 about it in 2001, but I can't remember when I 12 started teaching, whether it was 2001 or 2002. 13 I'm sorry. 2021, 2022. 14 Q. I was going to -- I was a little confused 15 there. So let me make sure I understand on the 16 record. 17 You started teaching a formal class in 18 biostatistics for the first time in about 2020, 19 2021 at the University of Miami? 20 A. I think it was 2021 or 2022, around there. 21 I think this past year was my -- it was either my 22 fourth or fifth year teaching this class. 23 Q. And that was the first time you'd actually 24 taught a formal class since graduate school. 25 Correct?</p>

<p style="text-align: right;">Page 53</p> <p>1 A. That is correct. I had done, like, 2 lecturing in other people's classes, which is very 3 common. And I had done a lot of teaching in terms 4 of, like, training residents, early career 5 physicians, about research methods, how to do -- 6 more like mentorship, which we in the university 7 setting consider teaching.</p> <p>8 Q. But I'm referring to what you called 9 formal classroom teaching. That began in 2020, 10 2021 up to now. Correct?</p> <p>11 A. You know, it's on my CV, so I can --</p> <p>12 Q. Great. Even better.</p> <p>13 A. So it looks like the first class started 14 it would have been January of 2022. So all the 15 prep was in 2021.</p> <p>16 Q. And that class is biostatistics?</p> <p>17 A. It is called statistical methods for 18 clinical and translational research. It is both 19 epidemiology and biostatistics.</p> <p>20 Q. Okay. Other than that class, have you 21 done any other formal classroom teaching at the 22 University of Miami?</p> <p>23 A. I'll give, like, guest lectures. In terms 24 of formal teaching, we -- so I'm the director of 25 the biostatistics core for the Florida Stroke</p>	<p style="text-align: right;">Page 54</p> <p>1 Registry. And we have a community health worker 2 course that we teach for -- to teach community 3 health workers about stroke. And I teach the 4 epidemiology section on that class.</p> <p>5 Q. Okay. And you teach along with some other 6 instructors who do other aspects of the class?</p> <p>7 A. Yup. So mostly physicians, physical 8 therapists. Other people teach the other topics.</p> <p>9 Q. You said a few minutes ago that you'd been 10 promoted to research assistant professor at the 11 University of Miami, and I think you indicated 12 that on your most recent CV. Is that correct?</p> <p>13 A. No, that's not correct.</p> <p>14 Q. Okay. Then tell me where I'm wrong.</p> <p>15 A. I was promoted to research associate 16 professor.</p> <p>17 Q. Oh, I'm sorry. Yes.</p> <p>18 A. I had been research assistant professor 19 and now I'm associate.</p> <p>20 Q. I went on the department of neurology at 21 the University of Miami Miller School of Medicine 22 website, and I see that there are a number of 23 people in the department who are described as 24 assistant professors or associate professors and a 25 then few others, a smaller number are called</p>
<p style="text-align: right;">Page 55</p> <p>1 either research assistant professors or research 2 associate professors.</p> <p>3 Can you explain for us what the difference 4 is between a research associate professor and just 5 an associate professor in the department of 6 neurology at the University of Miami Miller School 7 of Medicine?</p> <p>8 A. I thought you were going to ask why I am 9 not even either of those, why I'm listed as a 10 scientist. And that was just because I haven't 11 updated my page there in forever.</p> <p>12 So it sounds like I'm appropriately listed 13 as a research associate professor.</p> <p>14 So some people are clinical. So I'm not a 15 physician. I don't see patients. So my job in 16 the -- I'm not a neurologist. I'm an 17 epidemiologist, so I do research. I'm not a 18 clinician.</p> <p>19 Q. Meaning you don't see and diagnose 20 patients with neurological illnesses. Correct?</p> <p>21 A. Correct. I'm not a clinician. I'm not in 22 the hospital. I'm not in the clinical setting.</p> <p>23 And there are people who may do that but 24 still their sort of primary role is research. My 25 expertise is as an epidemiologist in the</p>	<p style="text-align: right;">Page 56</p> <p>1 department.</p> <p>2 Q. And you're an Sc.D., not an MD. Correct?</p> <p>3 A. That is correct. I have a doctorate of 4 science.</p> <p>5 Q. And so therefore, it would be accurate to 6 say, following from what you just testified, 7 you've never diagnosed an infant or a child with 8 ASD, autism, or attention deficit hyperactivity 9 disorder. Correct?</p> <p>10 A. That is correct. I don't do any 11 diagnosing, any sort of treating or diagnosing. 12 I'm not a clinician. I don't have patients.</p> <p>13 Q. Focusing on Exhibit 4 again, your most 14 recent CV, the one dated July 2025. You have it 15 there in front of you?</p> <p>16 A. I do.</p> <p>17 Q. You say your current academic rank is 18 research associate professor.</p> <p>19 So does the denomination or term "research 20 associate professor" indicate that you're not 21 clinical? I'm trying to understand the 22 distinction between a research associate professor 23 and a simple associate professor within the 24 department of neurology at the University of 25 Miami.</p>

<p style="text-align: center;">Page 57</p> <p>1 What's the distinction between research 2 associate and just associate?</p> <p>3 A. That's a very good question. I'm not 4 actually sure. I was really excited to be 5 promoted. I don't actually know about those 6 distinctions.</p> <p>7 Q. Is the research associate professor a 8 tenure track position?</p> <p>9 A. I am not -- I am not tenured, if that's -- 10 yeah. And maybe I will be one day, maybe not.</p> <p>11 Q. Do you understand currently that you're on 12 a tenure track?</p> <p>13 A. It sounds like you're telling me I'm on a 14 tenure track.</p> <p>15 Q. I'm just asking you if that's your 16 understanding.</p> <p>17 A. It sounds like you're my boss and, you are 18 on a tenure track.</p> <p>19 I haven't paid that much attention to it. 20 It's not like it's a supreme goal of mine. I have 21 a lot of confidence and security.</p> <p>22 Whether I get formal tenure one day or 23 not, I haven't paid that much attention to that.</p> <p>24 Q. Who is your supervisor or superior at the 25 University of Miami Miller School of Medicine that</p>	<p style="text-align: center;">Page 58</p> <p>1 you report to?</p> <p>2 A. So I have several. There's a department 3 chair who I work very, very closely with.</p> <p>4 Q. Who is that?</p> <p>5 A. His name is Jose Romano.</p> <p>6 Q. Who else?</p> <p>7 A. And then there's the vice chair of 8 research, which is -- I would say she's probably 9 my main person that I report to, that I interact 10 with. Her name is Tatjana Rundek.</p> <p>11 Q. R-U-N-D-E-K?</p> <p>12 A. Oh, her name? I was like, am I in DEK? 13 R-U-N -- I was like I don't even --</p> <p>14 Q. I was trying to spell her name.</p> <p>15 A. R-U-N-D-E-K.</p> <p>16 Q. Anyone else that you report to or consider 17 your supervisor there?</p> <p>18 A. The chair of my department for many, many 19 years tragically passed away a couple of years 20 ago. And I would have had him -- added him to the 21 list. He was our department chair forever.</p> <p>22 Q. Who was that?</p> <p>23 A. Ralph Sacco. He was the president of the 24 American Academy of Neurology, he was the 25 president of the American Heart Association, and</p>
<p style="text-align: center;">Page 59</p> <p>1 he was also the chair of our department.</p> <p>2 And he was my mentor. He was the person 3 who hired me. And really just a really great 4 leader of our department. I would have added -- 5 he died just very recently.</p> <p>6 Q. Did Dr. Sacco or has Dr. Rundek or 7 Dr. Romano ever told you, Dr. Gardner, you're on 8 a tenure track here at the University of Miami, so 9 keep up the good work, or something along those 10 lines?</p> <p>11 A. They tell me keep up the fabulous work all 12 the time. They have been, you know, my 13 cheerleaders and just an unbelievable support 14 system from Day 1.</p> <p>15 Q. What have they told you about tenure 16 track?</p> <p>17 MR. ESFANDIARY: Before you answer that 18 question, there's someone waiting in the waiting 19 room. Can you let them in, please? Steve Brady. 20 Thank you so much.</p> <p>21 I'm sorry. Please continue.</p> <p>22 A. Have I had conversations with Tatjana?</p> <p>23 I mean, she wants me to go very far in my 24 career, up to the top. You know, I don't recall 25 the specifics of our conversation. I don't have,</p>	<p style="text-align: center;">Page 60</p> <p>1 like, a timeline. Like, I'm not in the process of 2 applying for tenure. That's not . . .</p> <p>3 Q. I understand. And Dr. Sacco and 4 Dr. Romano and Dr. Rundek have never told you 5 specifically, Dr. Gardner, you're on a tenure 6 track here in Miami. Correct?</p> <p>7 A. I guess they've never said those words.</p> <p>8 Q. Okay.</p> <p>9 A. We probably have talked about sort of 10 timelines of when. To me, it feels -- I mean, I 11 just got promoted this year to research associate 12 professor, which was actually -- I guess we had 13 conversations when I moved to Boston. We had 14 conversations about when can I get back to Miami.</p> <p>15 At the time, modern-day life with Zoom and 16 my ability to be a director in the department, to 17 be a leader and all the things that are going on 18 in my career right now felt inconceivable living 19 far away.</p> <p>20 I mean, when I moved to Boston in 2012, 21 nobody -- there was no faculty that were -- that 22 was remote. They felt really desperate that I was 23 leaving.</p> <p>24 We weren't actually sure if I would be 25 moving back to Miami. And they said we would love</p>

<p style="text-align: right;">Page 61</p> <p>1 to try this whole remote thing. It was really 2 unprecedeted. Now it's not at all unprecedeted. 3 There are other faculty that work remotely, of 4 course.</p> <p>5 So I went to this scientist track. The 6 ability to -- part of being a professor is 7 providing service to the university and to the 8 department.</p> <p>9 And prior to the pandemic we couldn't 10 figure out how I could do all the service 11 components. That was sort of the stumbling block 12 for many years in terms of my promotion, how could 13 I provide service to the department, to the 14 university, if I lived all the way in Boston and I 15 couldn't come as frequently as they wanted me to 16 come.</p> <p>17 Once the pandemic hit and all of our, you 18 know, committee meetings and leadership meetings 19 are on Zoom, now that's much more conceivable.</p> <p>20 So we talked more about what this move 21 would mean in terms of my trajectory back in 2012 22 than we are now in 2025.</p> <p>23 Q. So you're in your 13th year at Miami. 24 Correct?</p> <p>25 A. No. I'm in my 18th year. Remember I</p>	<p style="text-align: right;">Page 62</p> <p>1 started in 2007. 2 Q. I'm sorry. You're right. 3 But going back to the question I asked 4 you, and I think before the lengthy answer you may 5 have answered it, but Dr. Sacco, Dr. Romano, and 6 Dr. Rundek have never said the words 7 "Dr. Gardener, you're on the tenure track." 8 Correct? 9 A. I don't know if they've ever said those 10 words. 11 Q. You don't recall, as you sit here today? 12 A. No. Like saying that sentence, I don't 13 recall. 14 Q. Okay. 15 A. I guess what's most pertinent is that it's 16 not like this is something I'm actively working 17 towards or something that's impossible now that I 18 am remote. It takes some time and process. 19 MR. KLATT: Object to the 20 nonresponsiveness and move to strike everything 21 beginning with "I guess." 22 Let's mark this as the next exhibit. 23 (Exhibit 5 marked for identification) 24 A. Do you want me to answer that question 25 again?</p>
<p style="text-align: right;">Page 63</p> <p>1 Q. No. That's just an objection I need to 2 make sometimes for the record. 3 A. Okay. 4 MR. ESFANDIARY: What number is this, 5? 5 MR. KLATT: Exhibit 5, I believe. 6 Q. Dr. Gardener -- 7 MR. KLATT: That's what I said. 8 MR. ESFANDIARY: Their experts are being 9 paid more. 10 Q. Dr. Gardener, we're looking at what we 11 marked as Exhibit 5, which was provided to us. 12 Did you prepare Exhibit 5, this "Summary 13 of Invoices for the Expert Services of Dr. Hannah 14 Gardener"?" 15 A. I did not. 16 Q. So you didn't prepare Exhibit 5. Correct? 17 A. I did not. It's very exciting to me. It 18 doesn't quite feel real, but I'm not at the same 19 time formally doubting it by any means on the 20 record. 21 Q. So I assume this relates to work you've 22 done on baby food litigation. Is that correct? 23 Referring to Exhibit 5. 24 A. This says "Summary of Invoices for the 25 Expert Services of Dr. Hannah Gardener."</p>	<p style="text-align: right;">Page 64</p> <p>1 So I guess maybe you tell me. I'm not 2 exactly sure what this is. 3 Q. Have you never seen it before? 4 A. I have never seen it before, as evidenced 5 by my reaction. It was like, "Whoa." 6 Q. It was provided to us by your attorney, so 7 that's why I'm asking you about it. 8 A. Okay. 9 Q. Do you think that Exhibit 5 is incorrect 10 in any respect? 11 A. Not necessarily. I did not prepare this. 12 I have no reason to say it's either correct or 13 incorrect. I can't verify it, and I don't know 14 what it encompasses. 15 Like you said, there have been many cases. 16 I don't know what this is inclusive of or 17 exclusive of. 18 Q. Do you know whether Exhibit 5 includes 19 invoices for what you refer to as the baby food 20 class actions or does Exhibit 5 only refer to the 21 baby food cases specifically alleging ASD and ADHD 22 that you've been involved in? 23 A. I have no idea. 24 Q. Okay. Let's look at the very first line. 25 And it looks like the first invoice begins</p>

<p style="text-align: center;">Page 65</p> <p>1 on March 11th, 2021, a little over four years ago. 2 Does that sound right to you about the time you 3 first got involved in baby food litigation? 4 A. No. Because the first payment would have 5 been for a retainer. 6 Q. Okay. And what amount was the retainer? 7 A. Probably \$5,000. 8 Q. Do you recall when that was paid? 9 A. Nope. But my guess is that typically -- 10 and maybe this isn't -- maybe I didn't do that 11 back then. But typically there would have been a 12 \$5,000 retainer. 13 So this is a summary of invoices, so I 14 guess I would not have invoiced for a retainer. 15 Q. You wouldn't do that? 16 A. I don't think I've ever invoiced for a 17 retainer. 18 Q. Do you require a retainer in all cases in 19 which you consult with attorneys? 20 A. There could have been some early cases 21 where I wasn't doing that yet. But certainly 22 since 2021, I would have asked for a retainer. 23 But I've never sent an invoice for a retainer. 24 Q. And do you bill against the retainer? 25 A. So I do a retainer billed against the last</p>	<p style="text-align: center;">Page 66</p> <p>1 invoice. So I guess I'll subtract that one from 2 the last one. 3 So I guess it makes sense if this was the 4 invoices that it wouldn't because I've never 5 invoiced just for that first initial payment. It 6 will come off of something. 7 Q. I'm looking at the last line before the 8 total. 9 A. Yup. 10 Q. The line on Exhibit 5, the summary of 11 invoices where the date is December 23rd, 2024 to 12 March 6th, 2025 and the amount is \$85,615. Do you 13 see that, Dr. Gardener? 14 A. I do. 15 Q. Do you know what that amount that was 16 billed for time between December 23rd, 2025 and 17 March 6th, 2025 was for? 18 A. I think it was -- well, considering the 19 fact that this -- that Exhibit 2, the date was 20 May 23rd, is that this would have -- this would 21 have covered a lot of the preparation for this 22 report. 23 Are you asking what I did for -- 24 Q. Exactly. I'm asking what you did between 25 December 23rd, 2024 and March 6th, 2025, which, by</p>
<p style="text-align: center;">Page 67</p> <p>1 the way, was the date of your deposition in the 2 Landon R. case, I believe, for which you billed 3 \$85,615. 4 A. That's very helpful. That anchors it 5 because I was trying to figure it out. 6 So yeah, that would have been for the 7 deposition of the Landon R. It would have been 8 for all the preparation and reports leading up to 9 that. 10 Q. You wrote both an original report and a 11 rebuttal report in the Landon R. case. Correct? 12 A. I don't recall. But if I did, that 13 probably would have -- I guess the rebuttal would 14 have been before the deposition so it would have 15 included the rebuttal too. 16 Q. Your hourly rate is \$650 an hour? 17 A. That is correct. But it's \$700 an hour 18 for deposition. 19 Q. Oh, it is? Has it always been more for 20 depositions? 21 A. No. 22 Q. When did you make that change? 23 A. I don't recall. 24 Q. Do you recall if you charged \$700 an hour 25 for your Landon R. deposition in March of this</p>	<p style="text-align: center;">Page 68</p> <p>1 year? 2 A. I don't recall exactly. I might have. 3 Q. When were you contacted about this case? 4 And when I say "this case," I'm referring to the 5 baby foods MDL for which you wrote your May 23rd, 6 2025 report. 7 A. I have no idea. They all sort of bleed 8 together and there is often an overlap. 9 So when I first got the email about this 10 one, honestly, I have no idea. 11 Q. Do you have any reason to dispute that 12 you've been paid \$323,688 so far in baby food 13 litigation? 14 A. I can't confirm or deny it. I didn't 15 create this. 16 Q. Does that sound like a reasonable amount? 17 A. Honestly, based on my reaction when I was 18 like, "Whoa." I mean, I know the transcript can't 19 reflect how much my eyes bulged. 20 If you had asked me 15 minutes ago to 21 guess, I would not have guessed that number. 22 Q. You would have guessed a larger or smaller 23 number? 24 A. I probably would have guessed a smaller 25 number. But children are expensive. So it</p>

<p style="text-align: right;">Page 69</p> <p>1 doesn't shock me.</p> <p>2 Q. What do you mean by "children are</p> <p>3 expensive"?</p> <p>4 A. I guess that, like -- I'm like, wow, I</p> <p>5 spent a lot of money. You know, camp and college</p> <p>6 and dance and basketball. Yeah.</p> <p>7 So I guess I would not have expected that.</p> <p>8 Yeah. I don't have a bank account with that money</p> <p>9 just sitting there for me to have seen it so</p> <p>10 readily.</p> <p>11 Q. How do you keep track of the time you</p> <p>12 spend on baby food litigation?</p> <p>13 A. Notes. Like a spreadsheet or notes of the</p> <p>14 time and what I'm doing and the date.</p> <p>15 Q. So let's say you spend two hours composing</p> <p>16 a report. On the spreadsheet you'll enter the</p> <p>17 date, you'll enter two hours and something like</p> <p>18 "drafting report." Is that how you keep track?</p> <p>19 A. Yeah. I don't know if you've seen my</p> <p>20 invoices. I know they have been produced in other</p> <p>21 depositions.</p> <p>22 But what I'll do is I'll say the date,</p> <p>23 I'll say the number of hours to the tenth of an</p> <p>24 hour -- yeah, tenth of an hour -- and I'll say</p> <p>25 broadly "literature review" or "writing the</p>	<p style="text-align: right;">Page 70</p> <p>1 deposition" or "writing a rebuttal" or "email with</p> <p>2 the lawyers" or "a conversation with the lawyers"</p> <p>3 and the hourly rate for that activity multiplied</p> <p>4 by the time spent, how much that day cost. And I</p> <p>5 do it by the day, and I add them up.</p> <p>6 Q. Going back to your testimony about \$650 an</p> <p>7 hour for your work, is that for everything that</p> <p>8 you do except testimony?</p> <p>9 A. It would be for the trial. So, like, the</p> <p>10 slight increase in rate is for depositions and for</p> <p>11 trial too.</p> <p>12 Q. You're talking about actual testimony,</p> <p>13 deposition or trial testimony?</p> <p>14 A. Deposition or being at -- yeah. I guess I</p> <p>15 don't really understand your question.</p> <p>16 Q. You just went through a number of</p> <p>17 activities you did: writing reports, talking with</p> <p>18 attorneys, emailing, reviewing things. I think</p> <p>19 for all those activities, my understanding is you</p> <p>20 charge \$650 an hour. Correct?</p> <p>21 A. That is correct.</p> <p>22 Q. Then if you have to testify either in a</p> <p>23 deposition like today or in court, you charge \$700</p> <p>24 an hour. Correct?</p> <p>25 A. That is correct.</p>
<p style="text-align: right;">Page 71</p> <p>1 Q. And you don't recall exactly when you made</p> <p>2 that switch. Correct?</p> <p>3 A. I don't. It wasn't in 2021, but it has</p> <p>4 been subsequent to that.</p> <p>5 Q. Okay. So other than those two rate</p> <p>6 levels, \$650 an hour, \$700, do you charge any</p> <p>7 other hourly rate for any other activity relating</p> <p>8 to baby food cases?</p> <p>9 A. Right now, no.</p> <p>10 Q. Approximately -- and I realize you might</p> <p>11 not have the records in front of you, but</p> <p>12 approximately how much time in hours have you</p> <p>13 spent on baby food litigation, including writing</p> <p>14 your report in this case, your rebuttal report,</p> <p>15 getting ready for this deposition, beginning,</p> <p>16 let's say, right after March 6th, 2025 when you</p> <p>17 gave your Landon R. deposition up to today as we</p> <p>18 sit here, July 31st, 2025?</p> <p>19 So in that time period, what's your best</p> <p>20 estimate of the number of hours you've spent on</p> <p>21 baby food litigation?</p> <p>22 A. I don't know. I haven't counted it up.</p> <p>23 Not even like a rough -- like, I haven't --</p> <p>24 Q. Have you kept track of it somewhere?</p> <p>25 A. I have.</p>	<p style="text-align: right;">Page 72</p> <p>1 Q. On this spreadsheet you referred to?</p> <p>2 A. Yes.</p> <p>3 Q. Okay. Can you just look back at that for</p> <p>4 us and just report to us when you get the</p> <p>5 transcript the number of hours you spent, just</p> <p>6 number of hours you spent between March 6th, 2025</p> <p>7 and today, July 31st, 2025?</p> <p>8 MR. ESFANDIARY: Before you answer that</p> <p>9 question, you can submit that to us separately.</p> <p>10 MR. KLATT: Do you have any objection to</p> <p>11 providing that number?</p> <p>12 MR. ESFANDIARY: I don't think so, but I</p> <p>13 think the understanding we've had and what we've</p> <p>14 received from you guys is a summary of invoices</p> <p>15 that we've received throughout the course of</p> <p>16 litigation. We did the same thing in the Landon</p> <p>17 case. But we can talk offline.</p> <p>18 MR. KLATT: I'm just trying to get an</p> <p>19 update in addition to the information contained</p> <p>20 on --</p> <p>21 MR. ESFANDIARY: If we could get the same</p> <p>22 thing from your guys, then sure. But if not, then</p> <p>23 no.</p> <p>24 MR. KLATT: I'm sure that will be worked</p> <p>25 out.</p>

<p style="text-align: right;">Page 73</p> <p>1 BY MR. KLATT:</p> <p>2 Q. As we sit here today, obviously you've 3 spent probably some significant amount of time 4 writing your report that we've marked as 5 Exhibit 2, writing your rebuttal report, 6 Exhibit 3, preparing for the deposition today, 7 since March 6th. Correct?</p> <p>8 A. That is correct.</p> <p>9 Q. Can you even estimate for me, would it be 10 more or less than 100 hours?</p> <p>11 A. Oh, I don't think it would be more than 12 100 hours.</p> <p>13 Q. Can you estimate -- and again, I'm not 14 going to hold you to it. Can you estimate whether 15 it would be more or less than 50 hours?</p> <p>16 A. I don't think it's -- I don't know. I 17 shouldn't surmise.</p> <p>18 Q. What did you do exactly to prepare to give 19 this deposition today?</p> <p>20 A. I read my report a couple times. I had 21 two brief conversations with Pedram. What else 22 did I do? I read some papers over again. My 23 guess is -- I don't know -- 12 or so. 12, 15, 24 maybe.</p> <p>25 Q. 12 to 15 articles?</p>	<p style="text-align: right;">Page 74</p> <p>1 A. Yeah.</p> <p>2 Q. Your report that we've marked as, what? 3 Exhibit 2, I believe, is over 100 pages long. 4 Correct?</p> <p>5 A. That is correct.</p> <p>6 Q. You said you've read that report several 7 times since you finished it. Correct?</p> <p>8 A. That is correct. I have not read every 9 single page. For example, I did not -- every time 10 I read it I don't, you know, review, for example, 11 my qualifications. I skipped to around page 17.</p> <p>12 Q. How long does it take for you to review 13 from page 17 to the conclusion of the report?</p> <p>14 A. I'm not sure exactly.</p> <p>15 Q. Would it be hours?</p> <p>16 A. It would take over an hour. Absolutely.</p> <p>17 Q. Having read through your report that we've 18 marked as Exhibit 2 several times since you 19 finished it, May 23rd, 2025, have you seen 20 anything in there that you want to correct?</p> <p>21 A. I've seen typos. I've seen a couple 22 typos.</p> <p>23 Q. Other than typos, have you seen anything 24 substantive that you'd want to correct in your 25 report that we've marked as Exhibit 2?</p>
<p style="text-align: right;">Page 75</p> <p>1 A. No, I haven't found anything substantive.</p> <p>2 Q. And you said you had a couple of 3 conversations with Mr. Esfandiary before the 4 deposition. Is that correct?</p> <p>5 A. That is correct.</p> <p>6 Q. Were those in person or via some other 7 communication method?</p> <p>8 A. We had one conversation on Zoom and one 9 just on the phone.</p> <p>10 Q. So only two conversations regarding this 11 deposition?</p> <p>12 A. That is correct.</p> <p>13 Q. And approximately how long did each of 14 those last?</p> <p>15 A. I want to say our conversation was about 16 15 minutes on the phone, and the Zoom maybe an 17 hour.</p> <p>18 Q. And when did those take place?</p> <p>19 A. We had a conversation yesterday and we had 20 a Zoom maybe two weeks ago.</p> <p>21 Q. Since you prepared your report in this 22 case on May 23rd, 2025, have you had conversations 23 with any other attorneys regarding baby food 24 litigation other than the two you've had with 25 Mr. Esfandiary?</p>	<p style="text-align: right;">Page 76</p> <p>1 A. Yup. Yes. I had a conversation with his 2 colleague Holly. And I think all of the 3 conversations that I've had have included Holly, 4 but there might have been other people on some of 5 the -- now I'm, like, doubting did I even -- I did 6 have two conversations with Pedram.</p> <p>7 I've definitely had conversations with 8 someone named Holly. Oh, I had conversations with 9 Holly in relation to --</p> <p>10 MR. ESFANDIARY: Don't disclose content.</p> <p>11 Q. Don't give me the substance. Well, it was 12 in relation to baby food litigation. Correct?</p> <p>13 A. Yup. Yes.</p> <p>14 Q. And how many conversations have you had 15 with Holly?</p> <p>16 A. I think two.</p> <p>17 Q. And what was the communication method? In 18 person? Zoom?</p> <p>19 A. There was one on the phone and one on 20 Zoom.</p> <p>21 Q. When did those take place?</p> <p>22 A. I mean, I shouldn't say -- I'm not 23 positive about any of this.</p> <p>24 Q. I understand.</p> <p>25 A. I've had a lot of conversations with a lot</p>

<p style="text-align: center;">Page 77</p> <p>1 of people, so I could be incorrect about some of 2 these things. I just want to say that. 3 I keep very good records. I just have not 4 memorized what those are. 5 Now I forget even what -- the question was 6 the method? 7 Q. Yeah. How did you communicate in these 8 conversations that you had with Holly? 9 A. I know I've had at least one Zoom with 10 Holly and one phone conversation with Holly, I'm 11 pretty sure. 12 Q. Other than Pedram or Holly, have you 13 communicated with any other attorneys regarding 14 baby food litigation since writing your May 23rd, 15 2025 report? 16 A. There were definitely other lawyers or a 17 other lawyer on at least one of the Holly Zooms, 18 but I don't remember what that person's name -- 19 I'm really bad with names. I can picture her, but 20 I don't know her name. 21 Q. You don't know Holly's last name? 22 A. Oh, Holly's last name? That wasn't what I 23 was referring to. 24 Q. You're referring to someone else? 25 A. Yeah. But also, I can't actually tell you</p>	<p style="text-align: center;">Page 78</p> <p>1 what Holly's last name is. Holly is probably 2 listening and is horrified. 3 Q. Is Holly an attorney? 4 A. Yes, Holly is an attorney. 5 Q. Do you know if she is with Wisner Baum, 6 Mr. Esfandiary's firm, or some other firm? 7 A. I am not positive. 8 I'm sorry, Holly. 9 Q. To the best of your estimation, since your 10 report, May 23rd, 2025, in this case, that we've 11 marked as Exhibit 2, you have had approximately 12 four phone conversations with attorneys in the 13 baby food litigation? 14 A. Oh, since March 6th? Is that what you're 15 asking? 16 Q. I actually was referring to your report, 17 the May 23rd date. Let's move it back to 18 March 6th. 19 Since March 6th, 2025, can you estimate 20 how many conversations you've had with attorneys 21 either in person or via Zoom or other 22 communication method regarding baby food 23 litigation? 24 A. I haven't had any meetings in person. 25 This is the first time since my last deposition</p>
<p style="text-align: center;">Page 79</p> <p>1 that I have seen any of the attorneys in person. 2 I just can't recall, like, how many Zooms or how 3 many phone calls. I just -- 4 Q. Do you know if any nonattorneys were 5 present on any of these Zooms or phone calls? 6 A. I don't, like -- on the Zooms, I don't ask 7 for people's credentials, so I don't know. I 8 don't even know Pedram's credentials. I'm 9 assuming he's an attorney. 10 Q. That may not be a valid assumption, so you 11 better check that. 12 A. Bottom line, in any of these matters I've 13 never asked when people have emailed me or I'm on 14 the phone or on zoom, I don't ask for people's 15 credentials. 16 Q. In addition to reading your report and the 17 conversations you've referred to, you said you'd 18 read some papers, maybe as many as a dozen, in 19 preparation for your deposition. Do you recall 20 which papers those were? 21 A. I can't tell you, off the top of my head. 22 No. I'm really bad with names. 23 Q. Why did you select those approximately 24 dozen papers to review before the deposition? 25 MR. ESFANDIARY: Without disclosing the</p>	<p style="text-align: center;">Page 80</p> <p>1 substance of any communications with counsel. 2 A. I mean, you know, I guess I don't know how 3 to answer that, then. 4 Q. So other than attorneys bringing certain 5 articles to your attention or asking you to review 6 them, did you choose to review any articles 7 yourself to prepare for today's deposition? 8 A. No. 9 Q. In preparing for today's deposition, did 10 you review any other documents other than your 11 report of May 23rd, 2025 that we've marked as 12 Exhibit 2 or these approximately dozen or so 13 articles that you've referred to? Did you review 14 any other written materials to prepare for your 15 deposition? 16 A. To prepare for today? No. I have read 17 other things. But if you're asking with the 18 intent to prepare for today . . . 19 Q. What other things have you read? 20 A. I was sent some of the other expert 21 reports from the other side. And I didn't have 22 time to read the entirety of them, but I read some 23 parts of those. 24 Q. And when did that happen? 25 A. Three weeks ago, four weeks ago.</p>

<p style="text-align: center;">Page 81</p> <p>1 Q. Is that before you prepared your rebuttal 2 report in the case?</p> <p>3 A. I think so.</p> <p>4 Q. In --</p> <p>5 A. I'm not sure. It's hard to remember, 6 like, what -- but it feels like -- when was my --</p> <p>7 Q. I think your rebuttal report is dated 8 July 15th, so it's a little over two weeks ago.</p> <p>9 A. Yeah. I think I would have read those -- 10 where did that go? Oh, this one. Yeah. I think 11 that would have been before then, I guess.</p> <p>12 Q. In preparing for today's deposition, did 13 you review any documents or articles that you had 14 not reviewed before preparing your report, your 15 May 23rd, 2025 report? Did you review any new 16 articles relating to your opinions?</p> <p>17 A. There was one new article that popped up 18 yesterday.</p> <p>19 Q. And do you know the author or the subject 20 matter?</p> <p>21 A. Yup. So the -- I'm pretty sure the 22 person's name was Brown. It was a recently 23 published article looking at lead levels in 24 children who were autistic. And I have seen that. 25 Probably -- yeah.</p>	<p style="text-align: center;">Page 82</p> <p>1 Q. Do you recall, did you print out a copy or 2 did you review it online?</p> <p>3 A. I reviewed it online.</p> <p>4 Q. What journal was it in?</p> <p>5 A. I don't recall.</p> <p>6 Q. And where were the -- was it children or 7 adults? Where were the subjects of the study 8 located?</p> <p>9 A. In order to confidently say that, I'd have 10 to find it. It was children.</p> <p>11 Q. And you don't recall where they were 12 located?</p> <p>13 A. I do not recall, off the top of my head.</p> <p>14 Q. Do you recall the results of the study?</p> <p>15 A. My understanding was that it was -- I 16 mean, I shouldn't surmise.</p> <p>17 Q. I'm just asking for your best 18 recollection.</p> <p>19 A. It was a study just including kids who 20 were autistic, I believe, and looking at their 21 blood lead levels and looking at correlates of 22 those blood lead levels. Basically making the 23 argument that -- and so it was not in the United 24 States, now that I'm saying I recall that, for 25 more, like, widespread blood lead level screening.</p>
<p style="text-align: center;">Page 83</p> <p>1 Q. And I'm sorry if I just asked this, but do 2 you recall the journal?</p> <p>3 A. I do not.</p> <p>4 Q. And what led you to find this article?</p> <p>5 A. It popped up -- it's on one of my devices.</p> <p>6 Q. Do you have some sort of dinger or alert 7 system that you use to bring new articles to your 8 attention?</p> <p>9 A. I don't.</p> <p>10 Q. So how is it that this popped up?</p> <p>11 A. I don't actually remember how -- like how 12 I found it. It must have been on PubMed. That 13 was the only new thing that I saw.</p> <p>14 I don't recall -- I actually don't 15 remember when it was published. I know it was 16 published in 2025. And then I scanned my report 17 to see that if it was in there, and I think it was 18 published since my report. But that did come up, 19 so that was something I read yesterday.</p> <p>20 Q. Did it change any opinions that you have 21 in your report?</p> <p>22 A. No. I have no corrections to be made to 23 my report.</p> <p>24 Q. Would you add it now to your materials 25 considered list?</p>	<p style="text-align: center;">Page 84</p> <p>1 A. Yes, I would.</p> <p>2 Q. Okay.</p> <p>3 MR. KLATT: And again, we'd ask if she 4 could supplement with that.</p> <p>5 MR. ESFANDIARY: Sure.</p> <p>6 A. I had meant to tell Pedram that I saw it 7 and then I just forgot.</p> <p>8 Q. Okay. Is it correct, Dr. Gardener, that 9 you hold no other academic appointments other than 10 at the University of Miami Miller School of 11 Medicine?</p> <p>12 A. That is correct. No other -- no other 13 universities. I'm also -- I was just talking to 14 the chair of the biostatistics department to get 15 another -- to get -- she wanted me to have an 16 appointment in her department too, but at no other 17 universities.</p> <p>18 Q. Okay. Has that appointment happened yet 19 or is that just something under discussion?</p> <p>20 A. I don't think so. I was just going to 21 actually email her with my -- in relation to my 22 promotion and say, you know, is it going to be in 23 that department too? So I don't think so.</p> <p>24 MR. KLATT: Let's mark this as an exhibit, 25 if we can.</p>

<p style="text-align: right;">Page 85</p> <p>1 (Exhibit 6 marked for identification)</p> <p>2 Q. Showing you something we've marked as</p> <p>3 Exhibit 6. And I'll represent to you,</p> <p>4 Dr. Gardener, this is from the University of Miami</p> <p>5 Miller School of Medicine, the John P. Hussman</p> <p>6 Institute for Human Genomics, the HIHG.</p> <p>7 Are you familiar with that institute?</p> <p>8 A. The HIHG, yes. I work with them a lot.</p> <p>9 Q. And it says, the title of this from their</p> <p>10 web page is, "Autism Spectrum Disorders or ASD."</p> <p>11 Do you see that?</p> <p>12 A. Yes.</p> <p>13 Q. And I want to see their description and</p> <p>14 see what you think about it.</p> <p>15 It says, "Autism is one of several</p> <p>16 conditions that fall under the general category of</p> <p>17 autism spectrum disorder or ASD."</p> <p>18 Do you agree with that?</p> <p>19 A. That's what it says. Yes.</p> <p>20 Q. And you agree with that?</p> <p>21 MR. ESFANDIARY: Objection. I think it's</p> <p>22 beyond the scope of her testimony.</p> <p>23 Go ahead.</p> <p>24 A. "Autism is one of several conditions that</p> <p>25 fall under the general category" . . .</p>	<p style="text-align: right;">Page 86</p> <p>1 So I think you asked me earlier when we</p> <p>2 were talking about ASD, we were referring to</p> <p>3 autism. And so yes.</p> <p>4 Q. And then skipping on down, it says "Twin</p> <p>5 sibling and family studies have demonstrated a</p> <p>6 strong role for genetic factors underlying</p> <p>7 autism." Do you see that?</p> <p>8 A. I do.</p> <p>9 Q. Do you also agree with that yourself?</p> <p>10 A. I'm not here to opine about the role of</p> <p>11 genetics in autism, but I have stated in my report</p> <p>12 that there's a genetic contribution.</p> <p>13 Q. So you would agree with that statement</p> <p>14 from the Hussman Institute at the University of</p> <p>15 Miami. Correct?</p> <p>16 A. I mean, to the extent that it echoes --</p> <p>17 it's sort of a broad statement that echoes what</p> <p>18 I've said in my report, that there is a strong</p> <p>19 role for genetics in autism.</p> <p>20 Q. And then it continues, "Previous studies</p> <p>21 in large families and autism typical</p> <p>22 neurodeveloping populations have identified a</p> <p>23 large number of genes and genetic variants that</p> <p>24 are associated with the development of autism."</p> <p>25 Do you see that?</p>
<p style="text-align: right;">Page 87</p> <p>1 A. I do.</p> <p>2 Q. And do you have any reason to disagree</p> <p>3 with that?</p> <p>4 A. I don't.</p> <p>5 Q. And then it goes on to say, "Researchers</p> <p>6 at the John P. Hussman Institute for Human</p> <p>7 Genomics, the HIHG, are continuing to conduct</p> <p>8 studies to understand the genetic basis of autism</p> <p>9 and how these genes and genetic variants act to</p> <p>10 alter neuronal function leading to the behavioral</p> <p>11 characteristics seen in autism." Did I read that</p> <p>12 correctly?</p> <p>13 A. You did.</p> <p>14 Q. And do you agree with that?</p> <p>15 A. So I'm not involved in this research that</p> <p>16 they're doing.</p> <p>17 Q. You're not involved with the autism</p> <p>18 spectrum research that the John P. Hussman</p> <p>19 Institute for Human Genomics in Miami is doing?</p> <p>20 A. No.</p> <p>21 Q. What is your interaction with them?</p> <p>22 A. So I do a lot of work with people at the</p> <p>23 HIHG on genetics of stroke, dementia, subclinical</p> <p>24 vascular outcomes. So we look at the genetics of</p> <p>25 carotid atherosclerosis. We have looked at</p>	<p style="text-align: right;">Page 88</p> <p>1 genetics of carotid disease in general, some</p> <p>2 cardiac biomarkers. We've looking at genetics of</p> <p>3 life's essential 8. Right now the paper that I'm</p> <p>4 working on with them right now is looking at that.</p> <p>5 I just wrote a grant with them looking at</p> <p>6 genetics and the interaction of genetics and</p> <p>7 nonmedical drivers of health, what we used to call</p> <p>8 social determinants of health, but not in relation</p> <p>9 to autism. More in relation to neurovascular</p> <p>10 diseases, stroke, dementia, carotid arthro, MRI,</p> <p>11 white matter disease, things like that.</p> <p>12 Q. Have you ever had a grant looking at any</p> <p>13 aspect of autism or attention deficit disorder,</p> <p>14 ADHD?</p> <p>15 A. I have not. I take that back.</p> <p>16 So there may have been -- in my work at</p> <p>17 Harvard there may have been -- I don't think it</p> <p>18 was grant funded, but I don't -- looking back, my</p> <p>19 thesis, I don't recall the funding that provided</p> <p>20 support for, like, the professor that I was</p> <p>21 working with for that.</p> <p>22 Q. And when was your thesis?</p> <p>23 A. When did I graduate? When did I present</p> <p>24 my thesis?</p> <p>25 Q. Right.</p>

<p style="text-align: right;">Page 89</p> <p>1 A. 2007. 2 Q. So about 18 years ago. Right? 3 A. That is correct. I've been an 4 epidemiologist for 18 years. 5 Q. You've referred to the Hussman 6 Institute -- and am I saying that correctly? Is 7 it Hussman? 8 A. Yeah. We call it the HIHG. 9 Q. The HIHG. You call it the HIHG as a 10 nickname? 11 A. It's the abbreviation that you see right 12 here. 13 Q. So looking further at Exhibit 6, down near 14 the bottom, "The HIHG says recent studies using 15 cutting-edge DNA sequencing technologies have 16 identified numerous genetic mutations that appear 17 to be involved in autism, suggesting that in most 18 cases rare variants in genes are driving 19 development of autism." Did you see that? 20 A. Yup. 21 Q. Do you have any reason to disagree with 22 that? 23 A. That it's rare variants versus other kinds 24 of variants? 25 Q. Correct.</p>	<p style="text-align: right;">Page 90</p> <p>1 A. I have not been involved in this research. 2 I am not here to opine about that, what kinds of 3 variants in genes, whether they're inherited or -- 4 Q. Do you have an opinion about that? 5 A. I do not. Nope. 6 Q. And then it goes on to say, "The HIHG says 7 these rare variants tend to fall into classes of 8 genes that regulate neuronal function by altering 9 the balance between excitatory and inhibitory 10 signals in the brain." 11 Do you agree or disagree with that 12 statement or not have an opinion? 13 A. I don't have -- this is not work that I 14 have been involved in or that I'm prepared to talk 15 about. 16 Q. And the last sentence in Exhibit 6 from 17 the HIHG says, "By finding the genetic factors 18 that cause autistic disorders and understanding 19 how these factors alter brain cell function, HIHG 20 researchers hope to gain valuable insights into 21 how autism develops, with the goal of improving 22 diagnostic and treatment approaches." 23 Do you have any basis to agree or disagree 24 with that statement? 25 A. No. I've not been involved with this, so</p>
<p style="text-align: right;">Page 91</p> <p>1 I can't say what they're hoping to do or -- I've 2 not been involved. I have no opinion. 3 Q. But you agree that genetic factors cause 4 autistic disorders. Correct? 5 MR. ESFANDIARY: Objection, misstates the 6 testimony. 7 Q. I'm just asking if you agree with that 8 statement. 9 A. So let me find -- in my report I talk 10 about the fact that absolutely there's a role for 11 genetics. In fact, I talk about the importance of 12 genetics in terms of the causal role of lead and 13 arsenic. 14 Q. I know you don't agree with this, but if 15 lead and arsenic were proven not to have a role in 16 autism, would you believe genetic factors still 17 were playing a role? 18 MR. ESFANDIARY: Objection, incomplete 19 hypothetical, calls for speculation. 20 A. That would depend on -- you're saying in 21 this hypothetical world where in 50 years we got 22 it all wrong about one thing, would we also 23 necessarily be getting it wrong on another thing? 24 Who knows? 25 Q. Do you believe that children who aren't</p>	<p style="text-align: right;">Page 92</p> <p>1 exposed to lead and arsenic can develop autism due 2 to genetic causes? 3 A. Show me a kid who's not been exposed to 4 lead and arsenic. It doesn't -- such a child does 5 not exist. 6 Q. So every child is exposed to lead and 7 arsenic? 8 A. Yes. 9 Q. And they're exposed to lead and arsenic 10 from a number of different sources. Correct? 11 A. That is correct. 12 Q. Is there a child in the world who's not 13 exposed to lead or arsenic? 14 MR. ESFANDIARY: Objection, calls for 15 speculation. 16 A. That's a hypothetical. 17 Q. Okay. But you would agree that the vast 18 majority of children in the United States and 19 around the world are all exposed to lead and 20 arsenic even before they're born. Correct? 21 MR. ESFANDIARY: Objection, overbroad, 22 calls for speculation. 23 A. I talked in my report just about how 24 significant the contamination of baby food is with 25 lead and arsenic and the fact that children are</p>

<p style="text-align: right;">Page 93</p> <p>1 exposed throughout their entire -- throughout 2 their entire lives.</p> <p>3 I mean, you know, it's really hypothetical 4 whether there's a child that exists somewhere.</p> <p>5 Q. Well, let's talk about exposure to lead 6 and arsenic other than what you believe is 7 exposure via baby food.</p> <p>8 Are babies exposed to lead and arsenic in 9 the womb before they're born?</p> <p>10 MR. ESFANDIARY: Objection, overbroad, 11 calls for speculation and beyond the scope.</p> <p>12 Q. That's not speculative at all, is it?</p> <p>13 MR. ESFANDIARY: All kids at all times?</p> <p>14 Q. You know that the vast majority of 15 children are exposed to lead and arsenic while 16 they're in the womb. Correct --</p> <p>17 MR. ESFANDIARY: Objection --</p> <p>18 Q. -- Dr. Gardener?</p> <p>19 MR. ESFANDIARY: -- calls for speculation, 20 overbroad.</p> <p>21 A. Are you talking about from all the 22 contaminated food or just in general?</p> <p>23 Q. Well, just answer my question first.</p> <p>24 Do you believe that unborn babies in their 25 mother's wombs, in utero, are exposed to lead and</p>	<p style="text-align: right;">Page 94</p> <p>1 arsenic?</p> <p>2 MR. ESFANDIARY: Objection, incomplete 3 hypothetical, calls for speculation, beyond the 4 scope.</p> <p>5 A. That's hypothetical whether there's a 6 child out there that exists that isn't, you know, 7 exposed to lead or arsenic. It's a hypothetical. 8 These are pervasive exposures.</p> <p>9 Q. So as pervasive exposures, all pregnant 10 mothers are exposed to lead and arsenic before 11 they get pregnant and while they're pregnant. 12 Correct?</p> <p>13 MR. ESFANDIARY: Objection, calls for 14 speculation, overbroad, beyond the scope.</p> <p>15 A. It depends. I guess theoretically there 16 could be such a child.</p> <p>17 Q. Well, wait a second. We're talking about 18 mothers now. Almost all mothers -- and let's 19 limit it to the United States. Virtually every 20 mother in the United States during her lifetime is 21 exposed to lead and arsenic. Correct?</p> <p>22 MR. ESFANDIARY: Objection. One second. 23 It calls for speculation, overbroad.</p> <p>24 Q. It's not speculative at all, is it, 25 Doctor?</p>
<p style="text-align: right;">Page 95</p> <p>1 MR. ESFANDIARY: Beyond the scope.</p> <p>2 A. I thought you were talking about the 3 children of those mothers.</p> <p>4 Q. We'll get to them in a minute. Let's talk 5 about the mothers. Adult mothers in the United 6 States are routinely exposed to lead and arsenic 7 throughout their lifetimes. Correct?</p> <p>8 MR. ESFANDIARY: Objection, calls for 9 speculation, overbroad, beyond the scope.</p> <p>10 A. You know, like, that is -- it's 11 hypothetical. I can't say that every single, you 12 know, mother is definitely exposed. I would 13 expect, if not all, the vast majority are exposed 14 to lead and arsenic during pregnancy, when they 15 were children.</p> <p>16 Q. As adults. Correct?</p> <p>17 A. People are exposed to lead and arsenic as 18 adults. Yes.</p> <p>19 Q. As we sit here today, you and I are 20 exposed to lead and arsenic in the air we breathe, 21 in the water we drink, in the food we eat, and all 22 sorts -- if we come into contact with dust and 23 dirt. Correct?</p> <p>24 MR. ESFANDIARY: Objection, calls for 25 speculation, overbroad, beyond the scope.</p>	<p style="text-align: right;">Page 96</p> <p>1 A. Yes, people are exposed, you know, in many 2 ways. I talked about that in my report.</p> <p>3 Q. And you understand that women -- men and 4 women, but women in particular, can sequester 5 heavy metals in their bones before they're 6 pregnant. Correct?</p> <p>7 MR. ESFANDIARY: Objection, beyond the 8 scope.</p> <p>9 A. Sequester?</p> <p>10 Q. Yeah. You know heavy metals can be 11 sequestered in bone in humans. Correct?</p> <p>12 A. I never use the term "sequester."</p> <p>13 Q. What term would you use?</p> <p>14 A. "Accumulate."</p> <p>15 Q. Sure. Great. You understand that lead 16 and other heavy metals can be accumulated in adult 17 human bone during the course of their lifetimes. 18 Correct?</p> <p>19 A. Yes.</p> <p>20 Q. And you understand that pregnant women, 21 because they have active bone turnover, can 22 release lead and other heavy metals into their 23 bloodstream which then expose their unborn child 24 to it. Correct?</p> <p>25 A. Yes.</p>

<p style="text-align: center;">Page 97</p> <p>1 Q. What are the levels of lead and other 2 heavy metals that on average U.S. children are 3 exposed to from their mothers while they're in the 4 womb before they're born?</p> <p>5 A. I don't have a statistic for that, off the 6 top of my head.</p> <p>7 Q. You don't have any level you could give me 8 on average or median level?</p> <p>9 A. That's what I thought you were asking 10 about, the median level. No, I don't know that 11 number, off the top of my head.</p> <p>12 Q. But you do know that mothers release lead 13 and other heavy metals from their bones into their 14 bloodstream during pregnancy. Correct?</p> <p>15 A. That is typically true.</p> <p>16 Q. And you know that bone metabolism is 17 particularly active during pregnancy and so you 18 can have even increased release during pregnancy 19 beyond what you would have when you're not 20 pregnant. Correct?</p> <p>21 A. I have not thoroughly reviewed the data on 22 bone metabolism during pregnancy.</p> <p>23 Q. Would you believe that if an unborn infant 24 is exposed to lead and arsenic and other heavy 25 metals in the womb before birth that that could be</p>	<p style="text-align: center;">Page 98</p> <p>1 a potential cause of autism and attention deficit 2 disorder later in their lives?</p> <p>3 MR. ESFANDIARY: Objection, calls for an 4 undisclosed opinion, beyond the scope of the 5 report, calls for speculation, incomplete 6 hypothetical.</p> <p>7 A. I mean, I did refer to the prenatal 8 literature, to some extent. I would say it's less 9 than the postnatal literature in relation to lead 10 and arsenic in relation to ASD and ADHD.</p> <p>11 But there is literature. It's beyond the 12 scope of this because we're talking about 13 postnatal exposure, but I did rely on the prenatal 14 exposure to some extent in forming these opinions.</p> <p>15 And I'm happy to read those sections of my 16 report.</p> <p>17 Q. Mr. Esfandiary can have you do that in his 18 time if he wants to. I'm just asking you, you 19 believe that children can develop autism due to 20 exposure to lead and other heavy metals prenatally 21 while they're in the womb. Correct?</p> <p>22 MR. ESFANDIARY: Objection, beyond the 23 scope of her expert testimony in this case, calls 24 for speculation, overbroad.</p> <p>25 A. I can say there are studies that have</p>
<p style="text-align: center;">Page 99</p> <p>1 related prenatal exposure to arsenic and lead in 2 relation to autism, but I haven't done the -- like 3 the thorough literature review and analysis to 4 opine about that to the same degree.</p> <p>5 My charges are related to postnatal 6 exposure. I've brought in some information about 7 prenatal because it did help inform my opinion. 8 But I haven't done the -- I haven't scrutinized 9 that literature to add that to my opinions. It 10 wasn't part of my charge.</p> <p>11 Q. Well, unrelated to your charge, I'm 12 talking to you as an epidemiologist, as a 13 scientist who's a self-professed expert in diet 14 and other environmental causes of neurologic 15 disease.</p> <p>16 You believe that prenatal exposure to 17 lead, arsenic or other -- and other heavy metals 18 to an unborn infant while they're still in the 19 womb can cause autism or ADHD. Correct?</p> <p>20 MR. ESFANDIARY: Objection, beyond the 21 scope of her expert opinions in this case, asked 22 and answered, calls for speculation.</p> <p>23 You can answer it again.</p> <p>24 A. So I want to remind you that I took an 25 oath here. And I take that really, really</p>	<p style="text-align: center;">Page 100</p> <p>1 seriously. And that oath applies to my charge and 2 to what I've come here to opine about today.</p> <p>3 I don't think it's responsible -- because 4 this is a formal setting. This isn't just you and 5 I at lunch talking about our opinions. This is a 6 formal setting where I've taken an oath, so it 7 would not be responsible for me to be opining 8 about topics that are not in here.</p> <p>9 I haven't done this rigorous analysis of 10 those prenatal exposures. Maybe I'll be asked to 11 in the future, in which case, you know, then I 12 would need to form those opinions and really do 13 that level of research.</p> <p>14 But I take this really seriously, so I 15 don't feel comfortable just sort of, you know, 16 telling you my opinions about things, even those 17 that I have expertise on.</p> <p>18 Q. Do you think it's important in formulating 19 your opinions in the case to determine whether 20 with respect to autism and ADHD the die is already 21 cast in utero before a child is ever born due to 22 exposure to lead or arsenic?</p> <p>23 A. Can you -- I'm not exactly -- the question 24 was sort of -- it took a turn.</p> <p>25 Q. Okay. I'm talking about the prenatal</p>

<p style="text-align: center;">Page 101</p> <p>1 period. I'm talking about when babies are in the 2 womb. Do you understand that?</p> <p>3 A. Yes.</p> <p>4 Q. Okay. I'm talking about the fact we've 5 already established that mothers can release heavy 6 metals from their bone and from their bloodstream 7 in -- crosses the placenta and gets to the baby. 8 Correct?</p> <p>9 A. Correct.</p> <p>10 Q. And this is a time of critical 11 neurodevelopment in the womb. Correct?</p> <p>12 A. Yes. I do believe that there's a lot of 13 neurodevelopment that occurs prenatally.</p> <p>14 Q. So it would be important in expressing 15 your opinions in this case to be able to rule out 16 the fact that prenatal exposure to heavy metals in 17 the womb causes ASD or ADHD in children. Correct?</p> <p>18 A. No.</p> <p>19 Q. It's not important?</p> <p>20 A. No.</p> <p>21 Q. Do you understand there's going to be a 22 general causation hearing in this case in 23 December, December 2025, in federal court in 24 San Francisco?</p> <p>25 A. I don't know about the date. No.</p>	<p style="text-align: center;">Page 102</p> <p>1 Q. Do you understand that the judge in that 2 case is Judge Corley?</p> <p>3 A. No.</p> <p>4 Q. Do you understand that Judge Corley may be 5 entitled to ask you questions at that hearing if 6 you appear and testify?</p> <p>7 A. I've never testified. I would say that 8 I'm fairly unfamiliar with how that all plays out, 9 who asks questions when.</p> <p>10 Every one of my family is a lawyer. I've 11 seen plenty of real-life cases. I've watched my 12 father. But I haven't paid attention to it. I 13 don't know all the rules. I can say I will follow 14 all of them.</p> <p>15 Q. I would hope so.</p> <p>16 A. Whatever the judge is allowed to ask me 17 and I am expected to answer, I will answer to the 18 best of my abilities.</p> <p>19 But if you're asking what I'm familiar 20 with in terms of what the judge may or may not ask 21 about, I'm not fully versed on that. I haven't 22 been through it yet.</p> <p>23 Q. Is your father a lawyer?</p> <p>24 A. He is.</p> <p>25 Q. And do you have other close relatives who</p>
<p style="text-align: center;">Page 103</p> <p>1 are attorneys?</p> <p>2 A. They're all. They're all attorneys.</p> <p>3 Q. Siblings?</p> <p>4 A. Yes.</p> <p>5 Q. How many?</p> <p>6 A. My brother is an attorney, my 7 sister-in-law is an attorney, my mother -- she's 8 retired. Actually, she's still an attorney.</p> <p>9 MR. ESFANDIARY: Mike, I could use a 10 bathroom break. We've been going for over an 11 hour.</p> <p>12 MR. KLATT: Let me ask just one or two 13 more questions and then we'll break.</p> <p>14 Q. If you testify in December at the 15 causation hearing and Judge Corley asks you, 16 Dr. Gardener, as someone whose work has centered 17 around diet and other environmental causes for 18 neurologic illnesses, what is your opinion whether 19 prenatal exposure to babies in their mother's 20 wombs to lead and arsenic can cause autism at that 21 point in time, how are you going to answer her?</p> <p>22 MR. ESFANDIARY: Objection, calls for 23 speculation.</p> <p>24 A. I mean, I guess I would want to sort of 25 learn from the lawyers in this case and any other</p>	<p style="text-align: center;">Page 104</p> <p>1 lawyers in my life about, like, you know, what am 2 I supposed to say to a judge when they ask me 3 about something that's touched upon in my report 4 but isn't, like, the central focus, is not part of 5 my charge, what am I supposed to do?</p> <p>6 And I will do whatever I'm supposed to do 7 professionally in that setting.</p> <p>8 Q. As a scientist, is it important to you to 9 rule out other possible alternative causes of 10 autism and ADHD in children other than baby food?</p> <p>11 A. To rule them out? Like, is it -- like, do 12 I need to say mothers who jump rope during 13 pregnancy -- in order to say if lead and arsenic 14 cause autism, do I need to know whether mothers 15 who jump rope during their pregnancy, does that 16 cause autism? No. That's not important.</p> <p>17 What I would need to rule out is the 18 possibility that lead and arsenic could -- like, 19 as an epidemiologist, I understand that autism, 20 ADHD, and virtually all chronic conditions are 21 multifactorial.</p> <p>22 If we were talking about a condition that 23 was really entirely genetic, like having high 24 lipoprotein (a), even high lipoprotein (a) isn't 25 100 percent genetic, but it's very, very, very,</p>

<p style="text-align: right;">Page 105</p> <p>1 very genetic. 2 I guess I would need to -- in order to 3 form opinions about other factors, I would need to 4 know if those factors were even, like, possible. 5 Like, that is the crux here. I talked 6 about that in my report. But that doesn't mean 7 having to rule out everything else. 8 MR. KLATT: We can take break. 9 MR. ESFANDIARY: Perfect. Thank you. 10 THE VIDEOGRAPHER: This concludes Media 11 Number 2. Going off the record at 11:27 a.m. 12 (Recess, 11:27 a.m. to 11:37 a.m.) 13 THE VIDEOGRAPHER: This begins Media 14 Number 3. Going back on the record, 11:37 a.m. 15 BY MR. KLATT: 16 Q. You said earlier, Dr. Gardener, that you 17 worked with people at the HIHG, the Hussman 18 Institute for Human Genomics at the University of 19 Miami Miller School of Medicine? 20 A. Yes, I did. 21 Q. Who do you work with there? 22 A. I have worked with Susan Blanton. 23 Q. Who else? 24 A. Liyong Wang. 25 Q. Anyone else?</p>	<p style="text-align: right;">Page 106</p> <p>1 A. What's his name? I'm blanking on the 2 guy's name. I've worked in the past with Susan 3 Slifer. 4 Q. How do you spell her name? 5 A. S-L-I-F-E-R. 6 I don't remember the guy's name who I just 7 wrote a . . . 8 Q. Have you ever told any of the people 9 you've worked with at the HIHG, Hussman Institute 10 for Human Genomics at the University of Miami, 11 your opinion that trace heavy metals in baby food 12 causes autism? 13 A. I don't think so. I've never had an 14 occasion to -- I've never talked with them about 15 autism. 16 Q. So you haven't proposed that you 17 collaborate with them on any study about genetics 18 and autism and heavy metals and autism. Would 19 that be correct? 20 A. Never. No. All of my work with the HIHG 21 people has been in relation to dementia, late-life 22 cognitive decline, cognitive function, cognitive 23 impairment, stroke, and then subclinical vascular 24 outcomes like carotid disease. 25 Q. And no one at the Hussman Institute for</p>
<p style="text-align: right;">Page 107</p> <p>1 Human Genomics at the University of Miami has ever 2 told you they think baby food is causing autism or 3 ADHD. Correct? 4 A. I have never had a conversation with 5 anyone at the Hussman Institute for Human Genomics 6 about autism, that I recall, or ADHD. 7 Q. So no one there has told you they think 8 that baby food causes or plays a role in autism, 9 ASD, or ADHD. Correct? 10 A. I've never had any conversations with 11 anyone at the HIHG about baby food or about autism 12 or about ADHD. 13 Q. But autism is a major area of their 14 research. Correct? 15 A. I don't know what percentage of their 16 research . . . 17 Q. Do you know they're conducting ongoing 18 studies of families whose children have autism and 19 siblings of children who have autism to determine 20 the genetic basis for autism? Are you aware of 21 that? 22 A. I am not aware of any of their work 23 outside of sort of what I have collaborated on. 24 Q. So they haven't asked you to have any 25 input on their studies of autism. Correct?</p>	<p style="text-align: right;">Page 108</p> <p>1 A. We work on issues related to dementia, 2 cognitive impairment, cognitive decline, stroke. 3 We're very busy with the topics that we have 4 covered. I don't have time to work with them on 5 autism. 6 Q. So my question is, no one at the Hussman 7 Institute for Human Genomics at the University of 8 Miami Miller School of Medicine has ever asked you 9 to collaborate with them on a study about autism. 10 Correct? 11 A. I've never had any conversations with 12 anyone at the HIHG about autism, baby food. I 13 have extensive collaboration with them about 14 dementia, cognitive impairment, stroke, and then 15 subclinical vascular outcomes. 16 Q. Were you aware of their work on the 17 genetics of autism before I brought that to your 18 attention today? 19 A. I have been aware they do some autism 20 research. What it is, the extent, who works on 21 it, how much, what they have found, I'm not 22 familiar with. 23 MR. KLATT: Let's mark this. 24 (Exhibit 7 marked for identification) 25 A. Every time you do this I feel like I'm</p>

<p style="text-align: center;">Page 109</p> <p>1 bracing myself for some article I've coauthored. 2 Q. You've read my mind. 3 So what I've just handed you is Exhibit 7. 4 And you're correct, it is an article that you 5 appear to have coauthored with Jaclyn Bowen and 6 Sean Callan. Correct? 7 A. Correct. 8 Q. And the title of the article is "Heavy 9 metals and phthalate" -- 10 Is that the way you say that? 11 A. That is correct. 12 Q. "Heavy metals and phthalate contamination 13 in prenatal vitamins and folic acid supplements." 14 Correct? 15 A. Correct. 16 Q. And you say -- that was published this 17 year? 18 A. Yeah, I guess it was. 19 Q. February of 2025. Correct? 20 A. I guess so. 21 Q. In "Environmental Research"?" 22 A. That is correct. 23 Q. And in the abstract you say the objective, 24 "The goal is to characterize the contamination of 25 prenatal vitamins and folate/folic acid</p>	<p style="text-align: center;">Page 110</p> <p>1 supplements with lead, cadmium, and phthalates." 2 Correct? 3 A. That is correct. 4 Q. And so in your introduction here, 5 Dr. Gardener, you say, "Fetal development is a 6 vulnerable period for exposure to toxicants, 7 including heavy metals and endocrine disrupting 8 compounds, EDCs." Correct? 9 A. Correct. 10 Q. You go on to say, "Exposure to heavy 11 metals (e.g. lead and cadmium) and EDCs (e.g. 12 phthalates) in utero have been shown to result in 13 pregnancy complications and impairments in 14 neurodevelopment, cognitive and behavioral health, 15 growth, metabolic and cardiovascular health, and 16 reproductive health throughout childhood." 17 Correct? 18 A. Correct. 19 Q. And you cite, it looks like, maybe 20 20 papers there in support of those statements. Is 21 that correct? 22 A. I cited 22. 23 Q. And those all relate to in utero effects. 24 Correct? 25 A. Presumably.</p>
<p style="text-align: center;">Page 111</p> <p>1 Q. "In utero" means in the womb before birth. 2 Correct? 3 A. Correct. 4 Q. And then you go on to say, "Phthalates 5 represent a class of plasticizers that are 6 frequently added to plastics, including tubing and 7 packaging, as well as fragranced personal care and 8 cleaning products." Correct? 9 A. Correct. 10 Q. And phthalates are ubiquitous in the 11 environment, are they not? 12 MR. ESFANDIARY: Objection, calls for 13 opinions that are beyond the scope of 14 Dr. Gardener's opinions in this case. 15 A. So phthalates are found in PVC, plastic, 16 in fragrance products, like I mentioned here in 17 some plastics. 18 Q. They're in a wide range of consumer 19 products. Correct? 20 MR. ESFANDIARY: Objection, beyond the 21 scope of Dr. Gardener's opinions. 22 A. It depends on how you define "wide range." 23 I mean, it's mostly like plastics and ingredients 24 in, like, personal care products. Like to make 25 fragrance stick to you.</p>	<p style="text-align: center;">Page 112</p> <p>1 Q. For example, phthalates are used in vinyl 2 flooring, in wall coverings? 3 MR. ESFANDIARY: Objection, beyond the 4 scope. 5 A. Not necessarily. So you can make PVC 6 without phthalates. Phthalates is one type of 7 plasticizers. I would say it used to be the most 8 common type of plasticizers, but now it's more 9 often that it's or it's highly frequent that it's 10 replaced with other types of plasticizers like 11 organotins. 12 Q. But my question is phthalates are used in 13 vinyl floorings and wall coverings. Some, not 14 necessarily all of them, but some. Correct? 15 A. Phthalates are used in some flooring, some 16 wall coverings. 17 Q. They're used in plastic packaging. 18 Correct? 19 A. Phthalates can be used in some plastic 20 packaging. 21 Q. And phthalates can be used in shampoos, 22 soaps, lotions, perfumes. Correct? 23 MR. ESFANDIARY: Objection. Beyond the 24 scope of Dr. Gardener's disclosed opinions. 25 A. It depends on the product. Some -- I am</p>

<p style="text-align: right;">Page 113</p> <p>1 not sort of fully versed in all the regulations 2 about plasticizer use right now. 3 But yeah. When I think of those sort of 4 products, phthalates is a potential exposure. 5 Q. That's what you meant when you were 6 referring to phthalates being frequently added to 7 fragranced personal care and cleaning products. 8 Correct? 9 A. Right. I mean, like, phthalates, they're 10 not on products as, like, an ingredient. You're 11 not going to see that, that I've seen. But they 12 can be -- what you'll often see is the term 13 "fragrance," which is an undisclosed, ambiguous 14 ingredient that can include phthalates. 15 Q. In products like shampoos, soaps, lotions, 16 perfumes. Correct? 17 MR. ESFANDIARY: Objection, beyond the 18 scope. 19 A. Phthalates can be in perfumes, lotions, 20 shampoos, personal care products. 21 Q. They can be in detergents and household 22 cleaners too. Right? 23 MR. ESFANDIARY: Same objection. 24 A. They can -- I think about it more in, 25 like -- like dryer sheets and things like that.</p>	<p style="text-align: right;">Page 114</p> <p>1 But they can be in cleaning products and 2 fragranced items to make fragrance stick. 3 Q. Phthalates can be plasticizers in 4 children's toys. Correct? 5 MR. ESFANDIARY: Objection, beyond the 6 scope of Dr. Gardener's opinions. 7 A. Now they're highly regulated in children's 8 toys. 9 Q. But they have been historically in 10 children's toys. Correct? 11 A. Historically phthalates have been in some 12 children's toys. Yes. In PVC toys. 13 Q. Going on -- well, let me ask you this: Do 14 you think phthalates in and of themselves are 15 capable of causing autism, autism spectrum 16 disorder, or ADHD in children via either in utero 17 exposure or postbirth exposure? 18 MR. ESFANDIARY: Objection, calls for 19 undisclosed opinion, beyond the scope of 20 Dr. Gardener's opinions in this case. 21 Q. You can answer. 22 A. So in this situation, you said autism or 23 autism spectrum disorder, which is different than 24 how you've worded things in the past. 25 Was there an importance for that</p>
<p style="text-align: right;">Page 115</p> <p>1 distinction? 2 Q. Not important at all. I'll rephrase it. 3 Is it your opinion that phthalates are 4 capable of causing ASD or ADHD or both in children 5 due to either their exposure in utero before birth 6 or after birth postnatally in infancy and early 7 childhood? 8 MR. ESFANDIARY: Objection, calls for 9 opinions, beyond the scope of Dr. Gardener's 10 disclosed opinions in this case. 11 If you have an opinion, you can offer it. 12 A. I haven't researched that at all. I 13 actually can't recall any papers that I have read 14 on phthalates and autism, again, at all recently. 15 So I'm not able to provide an opinion on that. 16 Q. Well, let's go back up to the first two 17 sentences in your article. You say, "Fetal 18 development is a vulnerable period for exposures 19 to toxicants, including heavy metals and endocrine 20 disrupting compound (EDCs)." 21 And then in very next sentence you say, 22 "Exposure to heavy metals (e.g. lead and cadmium) 23 and EDCs (e.g. phthalates) in utero have been 24 shown to result in pregnancy complications and 25 impairments in neurodevelopment, cognitive and</p>	<p style="text-align: right;">Page 116</p> <p>1 behavioral health, growth, metabolic and 2 cardiovascular health, and reproductive health 3 throughout childhood." Correct? 4 A. Uh-hmm. Yes. 5 Q. So you believe phthalates are capable of 6 causing impairments in neurodevelopment, cognitive 7 and behavioral health, either due to a child's 8 exposure in utero or after birth. Correct? 9 MR. ESFANDIARY: Objection, calls for 10 undisclosed opinions in this case. Beyond the 11 scope. 12 Doctor, if you have an opinion, you can 13 offer it. 14 A. So no. The way that this sentence is 15 written with all these -- with all of these 16 references does not imply that phthalates have 17 been shown to result in all of those things. 18 This is more general about, you know, I 19 mentioned phthalates falls under this EDC umbrella 20 and metals and EDCs in general have been 21 associated with all these different outcomes. 22 That does not imply that each one of these 23 compounds have been -- that I've included 24 references for each one of these compounds in all 25 of those outcomes.</p>

<p style="text-align: right;">Page 117</p> <p>1 Q. Phthalates is the one example of an 2 endocrine disrupting compound that you pointed out 3 in this article. Correct? 4 A. This is correct. 5 Q. Do you believe phthalates in utero can 6 result in impairments in neurodevelopment, 7 cognitive and behavioral health? 8 MR. ESFANDIARY: Objection, calls for 9 undisclosed opinions, beyond the scope of 10 Dr. Gardener's disclosed opinions in this case. 11 A. I am not prepared to opine on that. Like, 12 I have not done any systematic review of that 13 data. 14 Q. But that's what you told the world in 15 publishing this article, that you believed that 16 endocrine disrupting compounds, in particular 17 phthalates, in utero have been shown to result in 18 pregnancy complications and impairments in 19 neurodevelopment, cognitive and behavioral health. 20 Correct? 21 A. Where do you see that? In particular 22 phthalates have been -- 23 Q. I read the second sentence in your 24 article, your 2025 article. 25 A. Yeah. No. What I am saying is that heavy</p>	<p style="text-align: right;">Page 118</p> <p>1 metals and EDCs have been shown to result in all 2 of these different outcomes. 3 I gave phthalates as an example, but it's 4 not like -- it's not like this list of references 5 includes a reference for phthalates in relation to 6 all those. 7 That might exist. I don't know. The 8 reviewers would not have read it that way. My 9 colleagues would not have interpreted it that way. 10 It's not like -- I think what you're interpreting 11 this sentence to mean, that I could sit here and 12 say based on this sentence I have done a 13 literature review to say that phthalates -- in 14 this whole sentence, phthalates cause all of these 15 different outcomes. 16 That's not what this sentence implies. 17 Scientists would not read it that way. And if it 18 exists, it might, it might not. I am not here to 19 prepare to opine on phthalates in relation to all 20 of these things today. 21 Q. Why did you say phthalates, as an example, 22 in utero have been shown to result in pregnancy 23 complications and impairments in neurodevelopment, 24 cognitive and behavioral health? 25 Why did you put that in this article? It</p>
<p style="text-align: right;">Page 119</p> <p>1 could be read by any scientist or doctor out 2 there. 3 MR. ESFANDIARY: So hang on. There was 4 two questions there. It's compound. 5 Which one are you asking her? 6 Q. When you put this sentence in the article 7 to be read by scientists, laypeople, physicians 8 out there in the world and you used phthalates as 9 an example, why did you include phthalates as 10 something in utero that has been shown to result 11 in pregnancy complications, impairments in 12 neurodevelopment, cognitive and behavioral health? 13 A. Because this study was about -- the EDCs 14 that were the focus of this study were phthalates. 15 So it could -- people might be reading 16 this study and be like, all right, endocrine 17 disrupting chemical, how does this relate here? I 18 wanted to make it clear that phthalates were a 19 type of endocrine disrupting chemical. 20 Q. Well, let me just ask you, apart from what 21 you said in the article, is it your opinion that 22 endocrine disrupting compounds, including 23 phthalates, in utero can cause impairments in 24 neurodevelopment, cognitive and behavioral health? 25 Is that your opinion?</p>	<p style="text-align: right;">Page 120</p> <p>1 MR. ESFANDIARY: Objection, calls for an 2 undisclosed opinion, beyond the scope of 3 Dr. Gardener's testimony in this case. 4 A. Yes, I am going to repeat it again. I'm 5 here under oath. I'm here. My words matter. And 6 my words are, you know, trusted. I want to be 7 really careful to only talk about topics that I'm 8 prepared to talk about under oath. I take that 9 really, really carefully. 10 I am not prepared to talk under oath about 11 the impact of in utero exposure to phthalates with 12 all of these outcomes today. 13 Q. Aren't you careful when you write a 14 journal article that's published in a 15 peer-reviewed journal to be careful about your use 16 of words? 17 A. Absolutely. And I would love for all of 18 those scientists to read it. I am extremely 19 careful. My colleagues, we all review these 20 papers. It's peer-reviewed. 21 This was peer-reviewed and published by 22 one of the most respected journals out there, 23 "Environmental Research." So it's extremely 24 important for me to pass and excel in that very 25 rigorous review process and to make sure that it</p>

<p style="text-align: right;">Page 121</p> <p>1 is well understood by the scientific community.</p> <p>2 It's also very understood that people who</p> <p>3 don't have this training, lawyers, would not</p> <p>4 understand accurately every sentence I've read.</p> <p>5 My parents are both extremely smart.</p> <p>6 They're both lawyers. There's a lot of sentences</p> <p>7 in here that they would not understand correctly.</p> <p>8 It's not surprising that this sentence,</p> <p>9 that we might not totally be on the same page</p> <p>10 about this sentence.</p> <p>11 I wrote this for a scientific, for a</p> <p>12 medically trained audience.</p> <p>13 Q. Exactly. And did any peer reviewer of</p> <p>14 this article say, Dr. Gardener, don't suggest in</p> <p>15 here that EDCs, for example, phthalates, in utero</p> <p>16 have been shown to result in impairments in</p> <p>17 neurodevelopment, cognitive and behavioral health?</p> <p>18 A. No, they did not.</p> <p>19 Q. Okay.</p> <p>20 A. If they had, something like that, I would</p> <p>21 absolutely change the sentence.</p> <p>22 The peer reviewers for "Environmental</p> <p>23 Research" are top of the line. This is a really</p> <p>24 esteemed journal. If you get asked to review for</p> <p>25 this journal, you are far more likely to say yes</p>	<p style="text-align: right;">Page 122</p> <p>1 than many other journals.</p> <p>2 And if a reviewer, a trusted reviewer, had</p> <p>3 said, "This sentence, I think you're really</p> <p>4 stretching here, that doesn't sound right, it's</p> <p>5 going to be misinterpreted for this audience," I</p> <p>6 would have absolutely taken that into</p> <p>7 consideration.</p> <p>8 Q. And so you were perfectly willing to</p> <p>9 represent in this article, as approved by peer</p> <p>10 reviewers, that endocrine disrupting compounds,</p> <p>11 including phthalates, in utero have been shown to</p> <p>12 result in impairments in neurodevelopment,</p> <p>13 cognitive and behavioral health. Correct?</p> <p>14 A. So in terms of this sentence, what we said</p> <p>15 is that exposure to heavy metals and EDCs have</p> <p>16 been shown to result in all of those.</p> <p>17 That does not mean that EDCs -- that every</p> <p>18 single metal and every single EDC have been shown</p> <p>19 for all of those different outcomes.</p> <p>20 It's well understood in the medical field</p> <p>21 what we're saying, that heavy metals -- the point</p> <p>22 is that heavy metals and endocrine disrupting</p> <p>23 compounds have been shown -- and specifically in</p> <p>24 utero exposure have been shown to have very</p> <p>25 wide-ranging health effects, in the literature.</p>
<p style="text-align: right;">Page 123</p> <p>1 And that was the point of this sentence.</p> <p>2 Q. So let me ask you as an expert in diet and</p> <p>3 other environmental causes for neurologic</p> <p>4 diseases, is it your opinion that endocrine</p> <p>5 disrupting compounds, including phthalates, in</p> <p>6 utero can cause impairments in neurodevelopment,</p> <p>7 cognitive and behavioral health, like you stated</p> <p>8 in the article? Is that your opinion or not?</p> <p>9 MR. ESFANDIARY: So I think this has been</p> <p>10 asked and answered multiple times. I will object</p> <p>11 again to beyond the scope of Dr. Gardener's</p> <p>12 proffered expert opinion in this case.</p> <p>13 Q. Is it your opinion that phthalates and</p> <p>14 other endocrine disrupting compounds in utero can</p> <p>15 cause impairments in neurodevelopment, cognitive</p> <p>16 and behavioral health, or not?</p> <p>17 MR. ESFANDIARY: Same objections, beyond</p> <p>18 the scope.</p> <p>19 A. I take this oath really seriously. You</p> <p>20 know, my opinions when I'm talking about them here</p> <p>21 are opinions that have been really, really</p> <p>22 scrutinized. Not just opinions that I would have,</p> <p>23 you and me, at lunch.</p> <p>24 That was not part of my charge. I did not</p> <p>25 come here today prepared to provide an expert</p>	<p style="text-align: right;">Page 124</p> <p>1 witness level opinion on EDCs, including</p> <p>2 phthalates as well as other EDCs, in relation to</p> <p>3 all of these outcomes.</p> <p>4 Q. But you're willing to represent that in</p> <p>5 the peer-reviewed medical literature. Correct?</p> <p>6 A. I was absolutely comfortable writing this</p> <p>7 sentence. All of my colleagues were comfortable</p> <p>8 writing this sentence. The reviewers were</p> <p>9 comfortable with me publishing this sentence. The</p> <p>10 esteemed editors of this esteemed journal were</p> <p>11 comfortable with me writing that sentence.</p> <p>12 That is very different than me providing</p> <p>13 you with my opinions under oath in this</p> <p>14 circumstance. It's different because the</p> <p>15 implications of the sentence and the situation</p> <p>16 that we're in right now are very different.</p> <p>17 Q. You're saying you use more rigor in</p> <p>18 forming legal opinions than you do scientific</p> <p>19 opinions in the published literature? Is that</p> <p>20 what you're saying?</p> <p>21 MR. ESFANDIARY: No. You're misstating</p> <p>22 the testimony.</p> <p>23 Go ahead.</p> <p>24 A. They're just totally different.</p> <p>25 First of all, you are misunderstanding the</p>

<p style="text-align: right;">Page 125</p> <p>1 sentence. So that's just the first step. 2 But if you were not misunderstanding the 3 sentence, there is a very different -- there's a 4 big difference between writing these sentences 5 where it's understood, where I'm part of a 6 scientific community and trusted how scientists 7 who are the target audience for this will read 8 this sentence, and this setting where I'm actually 9 talking about things under oath in a -- in a 10 situation that carries a huge weight for a lot of 11 people, including you.</p> <p>12 I mean, it's out of respect for everyone 13 in this situation that my responsibility here is 14 much greater than a sentence written in an article 15 that a lay audience person might not interpret 16 totally correctly.</p> <p>17 Q. This isn't just any article, is it, 18 Dr. Gardener? This is an article published, as 19 you've just said, in a reputable peer-reviewed 20 medical or scientific journal. Correct?</p> <p>21 A. That is correct.</p> <p>22 Q. Do you apply a different standard for 23 opinions you express in peer-reviewed medical 24 journal articles in highly respected journals than 25 you do in giving opinions in the courtroom?</p>	<p style="text-align: right;">Page 126</p> <p>1 A. It's very, very different. It's a very, 2 very different process. 3 Q. And you use a different methodology? 4 A. No. I use a similar methodology. 5 But you are reading this sentence -- 6 you're reading this sentence with -- differently 7 than scientists would read it, which is -- you're 8 a lawyer. That's okay. I don't want to be 9 offensive to you in how you're reading this 10 sentence. 11 But it's really different than sitting 12 here under oath in a very, very high-stakes 13 situation than wondering how a lawyer might 14 misread a sentence in an introduction to a very, 15 very important piece of science. 16 Q. Exhibit 7, this article we've been talking 17 about for the last 15 minutes or so, are your 18 words. Correct? 19 A. They are. Yes. 20 Q. I have not misread them at all. Correct? 21 I have read them exactly like you wrote them in 22 the article. Correct? 23 A. No. What I keep saying is I think you are 24 misreading them. I don't mean to be offensive. I 25 am a scientist --</p>
<p style="text-align: right;">Page 127</p> <p>1 Q. What did I -- 2 MR. ESFANDIARY: Don't interrupt her. 3 Please finish your answer. 4 A. I understand you are a lawyer. You're 5 going to read this sentence differently than a 6 scientist would. 7 The scientists who coauthored this with 8 me, who reviewed it, who edited the paper, I 9 assume read it the way that it was intended, 10 saying that heavy metals in general and EDCs have 11 caused a wide range of health outcomes. 12 That doesn't . . . 13 I can tell you're about to interrupt me so 14 I stopped. 15 Q. Are you saying that I read your words into 16 the record inaccurately? 17 A. You read the actual -- I actually can't 18 remember if you read the actual -- you did say "in 19 particular phthalates" and it said "e.g., which 20 is "for example phthalates." 21 So this does not -- in the scientific 22 world, this does not mean that phthalates have 23 been proven to cause all of these different 24 outcomes. It's just -- it was a general sentence 25 saying that heavy metals and endocrine disrupting</p>	<p style="text-align: right;">Page 128</p> <p>1 chemicals have been shown in the literature. I 2 didn't write "in the literature." To result in 3 all of these -- in this broad range of outcomes. 4 Q. The reason that I said "in particular 5 phthalates" is that's the one example of an 6 endocrine disrupting compound you chose to 7 illustrate in this article. Correct? 8 A. Yes. And I did that because that is the 9 one endocrine -- the one type of endocrine 10 disrupting chemical that we were measuring in this 11 article. Because there are plenty of people who 12 would read this study who might not know what 13 phthalates are. Might be like, oh, endocrine 14 disrupting chemicals. I know what that is. 15 Phthalates fall under that category. 16 Q. I'm going to read the sentence again, and 17 I just want you to tell on the record whether I 18 read the sentence, the words you wrote, without 19 adding anything. 20 A. Sure. 21 Q. I'm referring to Exhibit 7 in the 22 introduction, the second sentence -- let's start 23 with the first sentence. 24 "Fetal development is a vulnerable period 25 for exposure to toxicants, including heavy metals</p>

<p style="text-align: center;">Page 129</p> <p>1 and endocrine disrupting compounds (EDCs)." 2 Did I read that correctly? 3 A. You read that correctly. 4 Q. The next sentence, "Exposure to heavy 5 metals (e.g." -- 6 Which means "for example." Correct? 7 A. Correct. 8 Q. -- "lead and cadmium) and EDCs (e.g. 9 phthalates)" -- 10 Meaning "for example phthalates." 11 Correct? 12 A. Correct. 13 Q. -- "in utero have been shown to result in 14 pregnancy complications and impairments in 15 neurodevelopment, cognitive and behavioral health, 16 growth, metabolic and cardiovascular health, and 17 reproductive health throughout childhood." 18 That's your words and I read them 19 accurately. Correct? 20 A. Yes, you did. 21 Q. Let's continue on. The bottom of that 22 paragraph you say, "Lead" -- 23 And I'm going to read your words. Tell me 24 if I get any of them wrong. 25 "Lead, cadmium, and phthalates are</p>	<p style="text-align: center;">Page 130</p> <p>1 clinically relevant and ubiquitous environmental 2 toxicants to which pregnant people are frequently 3 exposed in the United States and globally." 4 Did I read that correctly? 5 A. You did. 6 Q. And then you have several citations to 7 support that. Correct? 8 A. Correct. 9 Q. What did you mean by your use of the word 10 "ubiquitous" here? 11 MR. ESFANDIARY: One second. Insofar as 12 you're asking about phthalates, I'm going to lodge 13 an objection to beyond the scope of Dr. Gardener's 14 testimony and opinions in this case. To the 15 extent you're talking about lead and was cadmium, 16 that's acceptable. 17 MR. KLATT: No. 18 MR. ESFANDIARY: Yes. 19 MR. KLATT: No, there's no such objection. 20 That's completely out of line. 21 Your objections have been speaking 22 objections. They go beyond what Judge Corley 23 permits. She allows "objection" and you can state 24 a one- or two-word grounds. It doesn't need any 25 explanation.</p>
<p style="text-align: center;">Page 131</p> <p>1 What you just did right then, Pedram, was 2 totally inappropriate. And I guarantee you I can 3 show you Judge Corley's opinions or we can go to 4 her where she has sanctioned people for going 5 beyond those types of objections. 6 MR. ESFANDIARY: Okay. So I disagree with 7 all of that. I was just reiterating my objection 8 that to the extent you're asking about compounds 9 and chemicals that are not the subject of this 10 litigation, that are not being pursued in this 11 litigation, that there are no claims regarding in 12 this litigation, I'm going to continue to object 13 as beyond the scope in the same manner that you 14 guys have objected when we deposed your experts 15 about compounds and chemicals and matters that are 16 not within the 10-yard lines of their opinions in 17 this case. 18 Please let me finish before you interrupt. 19 So I'm going to continue lodging the same 20 objection to the extent you're asking about 21 phthalates. 22 To the extent you want to ask about heavy 23 metals, that's fair game and you're welcome to do 24 so. 25 MR. KLATT: You know there's no limitation</p>	<p style="text-align: center;">Page 132</p> <p>1 under the rules to ask an expert witness their 2 opinion about scientific matters that they claim 3 to be an expert on. 4 MR. ESFANDIARY: You are asking her about 5 that. I'm just objecting. 6 MR. KLATT: That's not a valid objection. 7 You can make the objection. You can say 8 "objection, I believe it's irrelevant, move on" or 9 whatever. But you don't need to give a speech 10 about what you think is within the scope or 11 without the scope. That's not an appropriate 12 objection. 13 MR. ESFANDIARY: Well, you're asking me, 14 you're challenging me on the basis of my 15 objection. So I'm just explaining to you what 16 they are. 17 Please, Counsel, continue asking questions 18 of Dr. Gardener. 19 MR. KLATT: Could you read the last 20 question before we had the little exchange. 21 (Pending question read) 22 A. I just want to explain, I'm not prepared 23 to provide expert opinions about phthalates today. 24 That wasn't part of my charge or what I, you know, 25 prepared for this.</p>

<p style="text-align: center;">Page 133</p> <p>1 And, like, under oath, I just didn't -- I 2 didn't prepare for, you know, to provide that kind 3 of expert testimony like I did about the heavy 4 metals.</p> <p>5 MR. SACHSE: Move to strike as 6 unresponsive.</p> <p>7 Q. Dr. Gardener, you wrote an article on 8 prenatal exposure to heavy metals and phthalates 9 in February 2025. Correct?</p> <p>10 A. That is correct.</p> <p>11 Q. And as an expert who purports to be having 12 much of their work relating to diet and other 13 environmental exposures causing neurologic 14 diseases, I'm entitled to ask you about your 15 opinions as a scientist, not just things the 16 lawyers have told you to restrict your opinions to 17 in this case. Do you understand that?</p> <p>18 MR. ESFANDIARY: Hang on. Whoa, whoa, 19 whoa. That was very compound.</p> <p>20 I object to the colloquy and I continue to 21 object as beyond the scope. Questions related to 22 phthalates are not the subject of this 23 examination.</p> <p>24 Doctor, if you have an opinion, you can 25 offer it.</p>	<p style="text-align: center;">Page 134</p> <p>1 A. I just want to say I am not a lawyer, so I 2 don't actually know your rules in your profession 3 about what you're allowed to ask about or not. 4 So it sounded like you were asking me if 5 I'm aware of what you, as a lawyer, are entitled 6 to do in this situation. And that's not -- I am 7 not aware. I am not at all trained, not one bit, 8 in the scope of what you're allowed to do here or 9 not.</p> <p>10 That's why Pedram is here. And you guys 11 can discuss this. But I don't want you -- I don't 12 want to purport to be aware of what you are or are 13 not allowed to do.</p> <p>14 Q. Do you hold yourself out as a scientific 15 expert on diet and other environmental causes for 16 neurologic diseases?</p> <p>17 A. Yes, I do. My understanding is that the 18 definition of being an expert is knowing a lot 19 more, significantly more than the general public 20 on a topic. That's what I've been told is the 21 definition. And I absolutely do.</p> <p>22 Q. Did you write a peer-reviewed journal 23 article in what you described is an eminently 24 respected medical journal in February 2025 about 25 phthalate and heavy metal contamination in utero?</p>
<p style="text-align: center;">Page 135</p> <p>1 A. I did. I want --</p> <p>2 MR. ESFANDIARY: Don't interrupt her.</p> <p>3 MR. KLATT: Wait. That's the response.</p> <p>4 She doesn't need to respond beyond that.</p> <p>5 MR. ESFANDIARY: You don't need to tell 6 her what she needs to respond. She needs to be 7 able to finish answering the question, so stop 8 interrupting her. You need to stop it.</p> <p>9 MR. KLATT: You know what? We're just 10 wasting a lot of time. We're going to come back.</p> <p>11 MR. SACHSE: Let's go off the record.</p> <p>12 MR. ESFANDIARY: No, I'm not willing to go 13 off the record. Please finish. Continue.</p> <p>14 MR. KLATT: We're going to call the judge, 15 Pedram. This is totally inappropriate.</p> <p>16 MR. ESFANDIARY: Answer the question, 17 Doctor.</p> <p>18 A. So when you write a peer-reviewed study --</p> <p>19 MR. KLATT: This is totally nonresponsive.</p> <p>20 MR. ESFANDIARY: Don't interrupt her.</p> <p>21 Please finish answering the question.</p> <p>22 MR. KLATT: We're just burning time.</p> <p>23 We'll be back here.</p> <p>24 MR. ESFANDIARY: You can answer the 25 question, Doctor.</p>	<p style="text-align: center;">Page 136</p> <p>1 A. When you write a peer-reviewed study, 2 you -- every sentence in the introduction, in the 3 discussion, you are not purporting to, you know, 4 provide an expert opinion on. The introduction 5 and the discussion is to set up the scientific 6 question and the importance.</p> <p>7 So, you know, I want to make that very 8 clear.</p> <p>9 You're not -- just because you wrote a 10 sentence in the introduction or the discussion 11 does not mean that based on that sentence you are 12 prepared for an eight-hour deposition or an expert 13 report on that. There's a really big difference.</p> <p>14 If this was a review article about 15 phthalates and reproductive health, that would be 16 very different than having those -- that be part 17 of a sentence in the introduction on something 18 else.</p> <p>19 This paper is not about the associations 20 between lead and cadmium and phthalates in all of 21 these outcomes.</p> <p>22 Earlier you asked me have I ever written 23 about lead and cadmium in neurodevelopment, and I 24 said no. And I think what you're trying to get at 25 is, oh, now I have, now I've actually published on</p>

<p style="text-align: right;">Page 137</p> <p>1 this.</p> <p>2 And so I think I have actually</p> <p>3 misunderstood. Earlier you said have you</p> <p>4 published on this? And I said no. And now you're</p> <p>5 sort of implying gotcha, you actually have</p> <p>6 published on this.</p> <p>7 That's really different than having a</p> <p>8 sentence in an introduction.</p> <p>9 MR. KLATT: Objection to the long</p> <p>10 narrative answer beyond everything after "I did."</p> <p>11 MR. SACHSE: Move to strike.</p> <p>12 MR. KLATT: Move to strike.</p> <p>13 BY MR. KLATT:</p> <p>14 Q. So let's go back to the article. You,</p> <p>15 Dr. Hannah Gardener, wrote in February 2025 in a</p> <p>16 peer-reviewed journal, "Lead, cadmium and</p> <p>17 phthalates are clinically relevant and ubiquitous</p> <p>18 environmental toxicants to which pregnant people</p> <p>19 are frequently exposed in the United States and</p> <p>20 globally."</p> <p>21 I read those words correctly. Correct?</p> <p>22 A. You did.</p> <p>23 Q. What is the word you chose to use here,</p> <p>24 "ubiquitous," what is the meaning of that in this</p> <p>25 sentence?</p>	<p style="text-align: right;">Page 138</p> <p>1 A. They're frequent exposures from different</p> <p>2 sources.</p> <p>3 Q. In the environment?</p> <p>4 A. As opposed to what?</p> <p>5 Q. Is that what you're referring to?</p> <p>6 A. I guess I don't know what would be the --</p> <p>7 when you said "in the environment," I guess I</p> <p>8 don't understand.</p> <p>9 Q. All right. So --</p> <p>10 A. Where else would they be than in the</p> <p>11 environment?</p> <p>12 Q. You would agree they're frequent exposures</p> <p>13 in the environment in the United States. Correct?</p> <p>14 A. Yes.</p> <p>15 Q. In pregnant --</p> <p>16 A. I would say, like, the point of this</p> <p>17 sentence is that these are common environmental</p> <p>18 exposures. They're not -- this isn't like --</p> <p>19 these aren't toxics that 1 percent of the</p> <p>20 population is exposed to. These are exposures</p> <p>21 that --</p> <p>22 Q. Are ubiquitous? They're everywhere.</p> <p>23 Right?</p> <p>24 A. No, they're not everywhere. Ubiquitous</p> <p>25 doesn't -- I mean, you know, words matter here in</p>
<p style="text-align: right;">Page 139</p> <p>1 this legal setting.</p> <p>2 Q. Yeah. I agree.</p> <p>3 A. In a general, you know -- if you and I</p> <p>4 were at lunch, I might say they're everywhere.</p> <p>5 But here, Hannah Gardener has said</p> <p>6 these -- they're everywhere. They're in this</p> <p>7 coffee cup. I'm not saying they're necessarily in</p> <p>8 this coffee cup, but they're frequent exposures.</p> <p>9 Q. And they're frequent exposures to men,</p> <p>10 women, adults, pregnant people, to children out</p> <p>11 there in the environment. Correct?</p> <p>12 A. These are -- lead, cadmium, and phthalates</p> <p>13 are frequent exposures to men, to women, to</p> <p>14 children, to babies. Yes. I was not implying --</p> <p>15 Q. To pregnant mothers?</p> <p>16 A. Yes. In this sentence I was specifically</p> <p>17 talking about pregnant people. But they're not</p> <p>18 specific to pregnant people.</p> <p>19 Q. Let's go to the next paragraph where</p> <p>20 you're talking about prenatal vitamins. And</p> <p>21 "prenatal" means before birth. Correct?</p> <p>22 A. That is correct. Although plenty of</p> <p>23 people take prenatal vitamins prior to conception</p> <p>24 and long after pregnancy.</p> <p>25 Q. You say, "Several recent studies have</p>	<p style="text-align: right;">Page 140</p> <p>1 explored prenatal vitamins as a source of heavy</p> <p>2 metal exposure during development," with studies.</p> <p>3 Correct?</p> <p>4 A. That is correct.</p> <p>5 Q. And it continues on, "particularly because</p> <p>6 they are ingested daily for months on end by most</p> <p>7 pregnant people." Correct?</p> <p>8 A. That is correct.</p> <p>9 Q. "Indeed, several studies have found</p> <p>10 prenatal vitamins are a significant source of</p> <p>11 maternal and fetal exposure to toxic metals."</p> <p>12 Did I read that correctly?</p> <p>13 A. That is correct.</p> <p>14 Q. Why would maternal and fetal exposure be</p> <p>15 something worthy of your concern here?</p> <p>16 A. Because this study was about prenatal</p> <p>17 vitamins.</p> <p>18 Q. And the prenatal and fetal time period is</p> <p>19 a critical window for neurodevelopment. Correct?</p> <p>20 A. Where do you see that in this sentence?</p> <p>21 Q. I'm just asking you. Is that that true?</p> <p>22 A. Oh, so this has nothing to do with this?</p> <p>23 Q. I'm just asking you.</p> <p>24 A. Sorry. Can you ask that question again?</p> <p>25 I was focused on this paper.</p>

<p style="text-align: center;">Page 141</p> <p>1 MR. KLATT: Could you read the question 2 back, please? 3 (Pending question read) 4 A. Neurodevelopment occurs during the 5 prenatal period. Yes. It also occurs -- 6 neurodevelopment of course continues on after. 7 But yes, neurodevelopment, there's a lot of 8 neurodevelopment during the prenatal period. 9 Q. In fact, turn to the very last page of the 10 article, page 5. You, Dr. Gardener, say, "Given 11 the critical role of prenatal development on 12 overall health, more attention needs to be paid to 13 understanding the implications of metal exposure 14 during this critical window." Correct? 15 A. Sorry. Where -- I didn't see where you 16 were. 17 Q. The very last sentence. 18 MR. ESFANDIARY: Right here. 19 A. Oh, the very -- yeah. 20 Q. Let me read it again because I want to 21 make sure that I read it correctly. 22 Your words are, "Given the critical role 23 of prenatal development on overall health, more 24 attention needs to be paid to understanding the 25 implications of metal exposure during this</p>	<p style="text-align: center;">Page 142</p> <p>1 critical window." Correct? 2 A. Correct. 3 Q. The critical window being the prenatal 4 period. Correct? 5 A. Correct. Because a lot of people don't 6 realize that the prenatal period affects pretty 7 much every single part of our health. 8 Q. Including future nerve development and 9 cognition. Correct? 10 A. Everything. I mean, most people -- I 11 mean, of course exposures after -- it's not like 12 just because the prenatal period is relevant for 13 dementia doesn't mean that we're not all -- 14 I spent this entire week at the 15 Alzheimer's Association meeting. We're all 16 looking at different risk factors throughout the 17 entire life course. That does not mean that the 18 prenatal -- just because there's a role for 19 prenatal development doesn't mean that there isn't 20 also, of course, a substantial role for every, you 21 know -- every period after that. It doesn't mean 22 that, oh, we're not looking at what people are 23 doing at age 60 in relation to their risk of 24 dementia. Of course not. 25 MR. KLATT: Object to --</p>
<p style="text-align: center;">Page 143</p> <p>1 A. Even though plenty of people already have 2 dementia at that point. 3 MR. KLATT: Object to the nonresponsive 4 portion of the answer. 5 Q. Go to page 4 of Exhibit 7, your article on 6 heavy metals and phthalates. And I'm looking at 7 the right-hand column. 8 Are you with me on page 4? 9 A. Yes. 10 Q. And not the very last paragraph but the 11 next-to-last paragraph. 12 A. The one that starts with, "This study did 13 not"?: 14 Q. Yes. 15 And I wanted to read a sentence and make 16 sure that I read your words correctly. 17 "It is crucial to consider that people 18 often take prenatal vitamins daily for many years 19 during the period prior to conception through the 20 postpartum period, including the time of pregnancy 21 and lactation. As a result, this represents a 22 frequent chronic long-term exposure often with the 23 same brand and type of vitamin consumed for the 24 entire duration among the most vulnerable segment 25 of the population."</p>	<p style="text-align: center;">Page 144</p> <p>1 Are those your words? 2 A. Yes. 3 Q. And then down at the bottom of that page 4 you say, "Conversely, increased consumption of 5 calcium and iron may act as antagonists for lead 6 and cadmium." 7 Did I read your words correctly? 8 A. Going on to page 5? 9 Q. Yes. 10 A. Yup. 11 Q. What do you mean when you say "consumption 12 of calcium and iron may act as antagonists for 13 lead and cadmium"? What does that mean? 14 A. It's what I talked about in my expert 15 report, that on a cellular basis the lead competes 16 with calcium and iron for receptors. It's exactly 17 what I talked about at length in my report. 18 Q. And what does it mean for calcium and iron 19 to be antagonists for lead and cadmium? What does 20 it mean, "antagonist" as you use it in that 21 sentence? 22 A. So they're competing for receptors. Lead 23 can mimic those receptors. 24 Q. Do you know in the diet of a child who 25 eats either commercial or homemade baby food, does</p>

<p style="text-align: center;">Page 145</p> <p>1 the amount of calcium and iron they consume far 2 exceed any trace heavy metals in the food they 3 consume? 4 A. In terms of the, like -- the milligrams, 5 for example? 6 Q. Exactly. Exactly. 7 A. Oh, my God. If it didn't, children would 8 have all been dead. I mean, we're talking 9 about -- we're talking about one of the most 10 potent neurotoxins here. 11 Q. So you're saying there's far more 12 consumption of calcium and iron in the diet of a 13 child who eats commercial or homemade baby food 14 than there is any trace lead or cadmium. Correct? 15 A. That's not what this sentence says. 16 Q. But do you believe that? 17 A. It would depend on the child. 18 Q. So I'm talking about in a normal child's 19 diet. And I think you just said that in order to 20 live, children have to be exposed to far more iron 21 and calcium than they would any trace heavy 22 metals. Correct? 23 A. What do you mean by "trace heavy metals"?</p> <p>Q. Trace heavy metals, the ones we've been 25 talking about: lead, arsenic.</p>	<p style="text-align: center;">Page 146</p> <p>1 A. So yeah, the lead exposure is significant. 2 But it is such a potent neurotoxin that if you ate 3 as much lead as many typical children eat of 4 calcium and iron, that would be catastrophic. 5 Q. So the typical child consumes far more 6 iron and calcium in their normal diet than any 7 trace heavy metal like lead. Correct? 8 MR. ESFANDIARY: Objection, overbroad. 9 A. I can't say for every single -- for every 10 single child. I mean, lead -- 11 Q. Typically. 12 A. Lead is so toxic that it would not -- 13 yeah. An understanding of this whole topic needs 14 to reflect the fact that lead is so toxic at such 15 small doses that one would never expect that you 16 would eat the same amount of lead that you would 17 eat in terms of calcium. 18 Q. Do you agree that calcium and iron are 19 regular components of a child's diet whether they 20 eat commercial baby food or homemade baby food? 21 MR. ESFANDIARY: Objection, overbroad, 22 calls for speculation. 23 A. Many children eat calcium and iron. I 24 don't have a stat to tell you about how the median 25 amount among kids in the United States --</p>
<p style="text-align: center;">Page 147</p> <p>1 Q. Did you feed your own children food that 2 was rich in calcium and iron? 3 A. I guess it depends on how you define 4 "rich." One of my children didn't eat a lot of -- 5 not much dairy at all, but I made sure that my 6 children, to the best of my ability -- actually, I 7 shouldn't say I made sure. I did my best to make 8 sure that my kids got what was needed in terms of 9 calcium and iron. 10 Overall, my kids ate a pretty typical 11 diet. 12 Q. And why was it important for them to get 13 calcium and iron? 14 MR. ESFANDIARY: Objection. Getting kind 15 of beyond the scope of Dr. Gardener's testimony in 16 this case. 17 But if you have an opinion, Dr. Gardener, 18 go ahead. 19 A. Why was it important for my children? 20 Because calcium and iron are good for children. 21 They're important nutrients for children to get 22 for their growth and development, without getting 23 into any specifics about my own children. 24 Q. Do you know specifically why iron and 25 calcium are important for infants and children's</p>	<p style="text-align: center;">Page 148</p> <p>1 development? 2 A. They're important for all sorts of -- for 3 all sorts of different health markers. I'm not 4 prepared to opine on all of the ways that calcium 5 and iron benefit children today. 6 Q. But certainly in your own experience, it 7 was important to see that your children got enough 8 calcium and iron in their diet? 9 A. Did I think about it very much? You know, 10 no. I actually thought a lot more, a lot more 11 about limiting their exposure to lead and arsenic. 12 That was the bigger challenge. 13 Q. Did your children eat commercial baby 14 foods? 15 A. One of my children, my first child -- my 16 first child -- I guess both of my children have 17 eaten commercial baby foods. In fact, you know, 18 they have as older kids too. Applesauce pouches 19 are things that actually older children sometimes 20 eat too. But they both have eaten some commercial 21 baby food. 22 Q. Are they grown now? 23 A. They are. 24 Q. Are they adults? 25 A. No, they're not adults, but they are</p>

<p style="text-align: right;">Page 149</p> <p>1 tweens and teens. 2 Q. And I'm sorry, did you say you had two 3 children or three? 4 A. I have two children. 5 Q. Okay. Go back to the article. I just 6 have one -- maybe one more question about it. 7 Exhibit 7. And I'm going to page 5. 8 After the sentence we just read about the 9 antagonist, it's the very next sentence. You 10 say -- and these are your words. Make sure I read 11 them correctly. 12 "It has been suggested that iron 13 deficiency can cause the absorption of lead and 14 cadmium," and you cite an article there. Correct? 15 A. Correct. 16 Q. I think we can put that aside. 17 MR. ESFANDIARY: Hey, Mike. It's 12:30. 18 When were we thinking of doing lunch? And we've 19 been going about an hour. 20 MR. KLATT: I'm happy to do it now if 21 you'd like. 22 THE VIDEOGRAPHER: This concludes Media 23 Number 3. Going off the record, 12:31 p.m. 24 (Lunch recess, 12:31 p.m. to 1:19 p.m.) 25</p>	<p style="text-align: right;">Page 150</p> <p>1 A F T E R N O O N S E S S I O N 2 THE VIDEOGRAPHER: This is the beginning 3 of Media Number 4. Going back on the record, 4 1:19 p.m. 5 BY MR. KLATT: 6 Q. Good afternoon, Dr. Gardener. We've had a 7 lunch break for a little while. Correct? 8 A. Correct. 9 Q. Before the lunch break, in questioning 10 this morning I had asked you questions about a 11 presentation you'd made regarding PFAS that you 12 testified to that you made earlier this year. And 13 then I asked you some follow-up questions about 14 PFAS that you were instructed not to answer. 15 We've had a discussion off the record, and 16 I'm going to go back and ask the court reporter to 17 read those questions that you were instructed not 18 to answer and I'm going to ask you to answer those 19 to the best of your ability on the record. 20 A. Okay. I wasn't sure which presentation 21 you were asking about. 22 MR. KLATT: We're not on the record yet? 23 THE VIDEOGRAPHER: We are on the record. 24 Q. You had mentioned earlier this morning 25 that there was some presentation you had made</p>
<p style="text-align: right;">Page 151</p> <p>1 regarding PFAS. So I was asking you follow-up 2 questions. You would know better than I what 3 presentation you were referring to. 4 A. I don't remember which -- I don't remember 5 the context about which presentation. But just 6 general presentations that I've made about PFAS? 7 MR. KLATT: Why don't we go off the 8 record. 9 THE VIDEOGRAPHER: Off the record, 10 1:20 p.m. 11 (Recess, 1:20 p.m. to 1:25 p.m.) 12 THE VIDEOGRAPHER: On the record, 13 1:25 p.m. 14 Please proceed. 15 BY MR. KLATT: 16 Q. Dr. Gardener, we took a short break to go 17 back and figure out when we -- this whole subject 18 of PFAS first came up in the deposition this 19 morning, and the court reporter read back to you 20 that testimony. 21 Now I'm going to ask her to read the first 22 question you were instructed not to answer, and I 23 would ask that you answer that, subject to any 24 objection. 25 MR. KLATT: Could you go ahead and read</p>	<p style="text-align: right;">Page 152</p> <p>1 that question about PFAS. 2 (Record read) 3 MR. ESFANDIARY: Objection, beyond the 4 scope. 5 You can answer. 6 A. I am not prepared to offer opinions about 7 PFAS in relation to autism and ADHD. I haven't 8 really studied that. 9 Q. Based on -- well, let me back up. 10 What was your presentation about? Because 11 you did reference some sort of nerve developmental 12 consequences of PFAS as part of your presentation. 13 What did that entail? 14 A. Yeah. So I remember there was a slide 15 showing basically all that we know about, like, 16 how PFAS affects different sorts of health 17 outcomes. And there may have been things about 18 neurodevelopmental outcomes on there. 19 The point of the slide was to basically 20 say there's been all this, you know, research on 21 PFAS in relation to so many different health 22 outcomes. I'm including some of the ones I'm 23 looking at. 24 So in my grant I'm looking at the 25 association between PFAS and lipid profiles. And</p>

<p style="text-align: center;">Page 153</p> <p>1 it's really well understood now that increased 2 exposure to PFAS deleteriously impacts lipid 3 profiles.</p> <p>4 But what is really much less known is how 5 PFAS impacts atherosclerosis, carotid 6 atherosclerosis, which impacts the delivery of 7 blood to your brain.</p> <p>8 And there have been no prospective 9 longitudinal studies, really no, like, strong epi 10 studies on PFAS in relation to dementia, in 11 relation to late-life cognitive impairment and 12 cognition in general, and talking about how that 13 is a substantial gap in the literature that my 14 grant is going to fill, is starting to fill.</p> <p>15 Q. In coming to your opinions in this case 16 about lead and arsenic in autism, ADHD, what 17 methodology have you employed to rule out any 18 potential role of PFAS as a cause of ADHD or ASD 19 in infants or young children?</p> <p>20 A. It's not necessary to rule out PFAS as a 21 cause of these things.</p> <p>22 For example, so this whole week, other 23 than today, I'm attending the Alzheimer's 24 Association meeting. It's the biggest Alzheimer's 25 Association meeting that happens annually.</p>	<p style="text-align: center;">Page 154</p> <p>1 This week it's in Toronto, and there are 2 so many lecturers talking about how diet impacts 3 dementia, how exercise, how sleep, the gut 4 microbiome, there's lectures about how heavy 5 metals impact dementia risk.</p> <p>6 None of that necessitates ruling out PFAS. 7 Nobody is like, whoa, we can't actually say 8 anything about exercising in relation to dementia 9 risk because Hannah Gardener's study on PFAS 10 hasn't ruled out PFAS.</p> <p>11 It is very well understood that dementia 12 is multifactorial, that there's so many causes of 13 dementia, including genetics and including 14 environmental, lifestyle exposures.</p> <p>15 And talking about the causality of those 16 exposures does not mean that we have ruled out the 17 impact of PFAS.</p> <p>18 The exact same is true for autism. We 19 don't need to rule out or rule in PFAS as a 20 causal -- as a cause of autism in order to say 21 that lead and arsenic exposure causes autism or 22 ADHD.</p> <p>23 I think it's probably very well understood 24 that we knew that smoking causes lung cancer 25 before we really understood that radon also causes</p>
<p style="text-align: center;">Page 155</p> <p>1 lung cancer.</p> <p>2 The fact that radon causes lung cancer 3 does not mean that smoking doesn't cause lung 4 cancer or that smoking definitely causes lung 5 cancer.</p> <p>6 All these sort of chronic diseases are 7 well understood to be multifactorial.</p> <p>8 I don't need to write a whole expert 9 report on PFAS in relation to autism in order to 10 say with confidence that my opinion is that lead 11 and arsenic exposure are causally associated with 12 autism and ADHD.</p> <p>13 Q. Being an expert, as you've indicated, on 14 environmental causes for neurologic diseases, 15 based on your scientific knowledge base and 16 opinion, do you think it's possible that PFAS may 17 be causing or contributing to ASD or autism?</p> <p>18 MR. ESFANDIARY: Objection, beyond the 19 scope of Dr. Gardener's opinion and testimony in 20 this case.</p> <p>21 A. I am not prepared to opine here under 22 oath, something I take really, really seriously.</p> <p>23 MR. ESFANDIARY: Please don't interrupt 24 her.</p> <p>25 Q. We'll take that for granted. But go</p>	<p style="text-align: center;">Page 156</p> <p>1 ahead.</p> <p>2 A. I am not prepared here to provide expert 3 witness opinions about PFAS in relation to autism 4 and ADHD.</p> <p>5 You want to ask me about PFAS in relation 6 to dementia? I have done that level of research.</p> <p>7 Q. Did any of the studies that you rely on 8 for your opinions about lead and arsenic being 9 potential causes of ASD or ADHD, did any of those 10 studies examine potential alternative chemicals 11 like PFAS or phthalates?</p> <p>12 A. I would have to go back and look. Many of 13 the studies did look at chemicals beyond lead and 14 arsenic.</p> <p>15 For example, a lot of them included other 16 metals in their analyses. Other studies did look 17 at other chemicals, but I don't remember sort of 18 which ones looked at which.</p> <p>19 That wasn't sort of the aspect of the 20 studies that I was including in my report, so I 21 can't refer to my report in -- I might have some 22 mention of in quoting reports to sort of say which 23 studies looked at which.</p> <p>24 I would say most of them didn't just look 25 at lead or didn't just look at arsenic. Most of</p>

<p style="text-align: center;">Page 157</p> <p>1 them did actually measure multiple compounds. 2 Q. Do you recall any looking at the potential 3 effects of PFAS as a cause of either ASD or ADHD? 4 A. Did any measure PFAS? I can't recall. 5 It's possible that none of these ones did. 6 Q. And same question about phthalates. Do 7 you recall any studies that you cited in your 8 report concerning lead and arsenic in ASD or ADHD, 9 did any of those studies, to your recollection, 10 evaluate the potential for phthalates to be a 11 cause of ASD or ADHD? 12 A. I don't recall. But again, it is assumed 13 that, even from an environmental toxin standpoint, 14 that my opinions about lead and arsenic causing 15 ASD and ADHD don't require that other 16 environmental toxins also cause these, nor does 17 the fact that other environmental toxins causing 18 these rule out the fact that lead and arsenic -- 19 one of the Hill criteria is, you know, do -- have 20 these metals caused related neurodevelopmental 21 outcomes or similar outcomes and do other related 22 compounds cause ASD and ADHD. 23 And there is sort of -- there is that 24 analogy. But that's not a requirement. It's not 25 a requirement that other similar compounds cause</p>	<p style="text-align: center;">Page 158</p> <p>1 these outcomes for lead and arsenic to also cause 2 these. 3 And these are not the same -- phthalates 4 are not heavy metals. PFAS are not heavy metals. 5 They're distinct compounds. 6 Q. Do you agree that to determine whether the 7 exposure to ASD in a particular child has caused 8 ASD or ADHD, you'd also need to consider other 9 factors like phthalates and PFAS? 10 A. So that's an issue of specific causation 11 that's not part of my charge. What I look at is 12 on a population-wide level. 13 On a population-wide level we don't need 14 that. We know that lead and arsenic can cause ASD 15 and ADHD even when there are other causes of those 16 as well. 17 In terms of the methodologies of specific 18 causation, that's not part of my charge. And I 19 should not be opining on that methodology. 20 Q. Do you think it would be important to 21 consider other factors as alternative causes for 22 ASD or ADHD in a particular child? 23 MR. ESFANDIARY: Objection, beyond the 24 scope. 25 A. That's not really -- that's not, like,</p>
<p style="text-align: center;">Page 159</p> <p>1 part of my charge. As an epidemiologist, I'm 2 trained to think about this on a population-wide 3 level. 4 Of course on a population-wide level we 5 expect that these outcomes are multifactorial. We 6 understand that there are many environmental 7 toxins as well as genetic factors that contribute 8 to the causation of these outcomes, just like it's 9 very intuitive, I think, for people to understand 10 that stroke and dementia, which I study all the 11 time, are multifactorial. 12 Just because blood pressure is very, very 13 important in terms of stroke etiology does not 14 mean that smoking isn't, doesn't mean that alcohol 15 consumption isn't, and it doesn't mean that PFAS 16 might be as well. We don't have that strong 17 evidence yet. 18 There's suggested links with stroke, but 19 it's not like we don't study PFAS as a potential 20 risk factor for stroke just because we know that 21 smoking and high blood pressure and diabetes cause 22 stroke. 23 Q. What methodology do you use when you're 24 looking at studies on a population level to rule 25 out things like phthalates and PFAS and brominated</p>	<p style="text-align: center;">Page 160</p> <p>1 flame retardants, for example, as potential causes 2 of autism or ADHD? 3 A. On a population-wide level, if I were to 4 rule it out, I would look at the evidence. 5 Q. And have you done that in this case? 6 A. Sorry. Have I done what? 7 Q. Looked at the evidence on the potential 8 causation of autism -- excuse me. Start over. 9 Have you looked in this case at the 10 potential causation of PFAS, phthalates, or 11 brominated flame retardants, for example, to rule 12 them out as causes of autism or ASD on a 13 population level? 14 A. As part of this case, no. So my role in 15 this case is to consider the evidence for 16 causation for lead and arsenic. That is 17 irrelevant, whether brominated flame retardants or 18 PFAS or phthalates, organotins are ruled in or 19 ruled out. It is irrelevant to lead and arsenic. 20 So if we ruled -- if someone ruled those 21 in, that doesn't mean that my evidence about lead 22 and arsenic is not also present. 23 So for example, if we're trying to think 24 about does smoking cause lung cancer or not, you 25 can make that causal determinant without ruling in</p>

<p style="text-align: center;">Page 161</p> <p>1 or ruling out radon. You want to consider it. 2 You want to think about it, especially if the two 3 things were perfectly correlated, which we know 4 that they're not.</p> <p>5 The fact that radon causes lung cancer 6 does not actually mean that smoking does or does 7 not cause lung cancer. We have to look at the 8 literature on smoking.</p> <p>9 So my charge here had nothing to do, was 10 not particular to those other chemicals. And it's 11 not -- they're not so closely related where, you 12 know, oh, if the literature said to me, you know 13 what, we can't say that PFAS causes autism. That 14 would not make me be like, oh, you know, lead and 15 arsenic can't cause autism.</p> <p>16 Q. Using your example of lung cancer, I think 17 you've pointed out not all causes -- not all lung 18 cancers are caused by smoking. Correct?</p> <p>19 A. There are plenty of people who get lung 20 cancer who never smoked. I mean, according to the 21 data.</p> <p>22 So for those people, they did not smoke, 23 so smoking could not have caused their lung 24 cancer.</p> <p>25 I mean, secondhand smoke for those people,</p>	<p style="text-align: center;">Page 162</p> <p>1 sure. They could have. But smoking is not a 2 necessary cause of lung cancer. You can get lung 3 cancer and never have smoked a cigarette in your 4 entire life.</p> <p>5 Q. Nor is lead or arsenic a necessary cause 6 of autism or ADHD. Correct?</p> <p>7 A. That's a hypothetical. There are many 8 people who have never once smoked a cigarette. I 9 haven't seen a large scale study of, you know -- 10 of autism and ADHD in which, you know, everyone 11 has a blood lead level of zero, you know.</p> <p>12 So that's a question that's left to be 13 determined. That wasn't actually part of my 14 charge.</p> <p>15 As I spoke -- as I wrote about in my 16 report, it may -- when we're talking about 17 specific causation -- my report saying that lead 18 and arsenic can cause autism on a population-wide 19 basis does not mean -- does not indicate how 20 etiologically relevant it is for each and every 21 child.</p> <p>22 That's an issue of specific causation, and 23 that's not part of my charge. And that would 24 require, you know, considering all sorts of 25 history, life history and exposures for those</p>
<p style="text-align: center;">Page 163</p> <p>1 individual children.</p> <p>2 Q. And exposures like phthalates, PFAS, and 3 brominated flame retardants. Correct?</p> <p>4 MR. ESFANDIARY: Objection, beyond the 5 scope.</p> <p>6 A. I can't say that. I'm not here saying 7 those are all risk factors for autism and ADHD.</p> <p>8 That's not part of my charge here, just 9 like what I can say confidently on a 10 population-wide basis, we can say that lead and 11 arsenic cause autism and ADHD, in the absence of a 12 convincing body of literature on so many different 13 compounds, just like we epidemiologists came to 14 say smoking causes lung cancer, even in the 15 absence of -- back in those days, we didn't know 16 anything about PFAS. PFAS was just starting to be 17 used.</p> <p>18 That doesn't mean that we're now not able 19 to say that PFAS causes -- that smoking causes -- 20 we're not reconsidering whether smoking causes 21 lung cancer because of lack of data on PFAS.</p> <p>22 Q. Is it your belief that all causes of 23 autism and ASD are the result of lead or arsenic 24 exposure?</p> <p>25 A. That question makes no sense. Sorry.</p>	<p style="text-align: center;">Page 164</p> <p>1 Do you want to rephrase it?</p> <p>2 Q. Is there a group in the population that 3 has ASD and ADHD for which lead or arsenic was not 4 a cause?</p> <p>5 MR. ESFANDIARY: Objection, calls for 6 speculation.</p> <p>7 A. I would say that's an issue of specific 8 causation. I mean, I'm here to talk about on a 9 population-wide level.</p> <p>10 Q. That's not what I'm asking --</p> <p>11 MR. ESFANDIARY: Don't interrupt her.</p> <p>12 Q. That's what I'm asking you. I'm asking 13 you on a population level whether you think there 14 is a group of children whose ASD and/or ADHD has 15 nothing to do with exposure to lead or arsenic.</p> <p>16 MR. ESFANDIARY: Calls for speculation.</p> <p>17 A. I'm here to say that lead and arsenic are 18 causally associated with autism and ADHD.</p> <p>19 How relevant they are for each individual 20 person, that's an issue of specific causation. In 21 the epidemiology world, we think about a time 22 machine, like, could we go back and create that 23 hypothetical child and have, you know, there be no 24 lead and arsenic in this world and would that 25 child still get autism.</p>

<p style="text-align: center;">Page 165</p> <p>1 That's more of a theoretical concern for 2 epidemiologists that was not part of my charge. 3 My charge was to look at on a 4 population-wide basis, are lead and arsenic 5 causally associated with ASD and ADHD. And, you 6 know, I can read you my opinion, but they are, 7 yes.</p> <p>8 Q. As part of your methodology in arriving at 9 your conclusions in this case, did you consider 10 that there are population-level segments whose ASD 11 and ADHD was not caused by exposure to lead or 12 arsenic?</p> <p>13 A. So the fact that lead and arsenic cause 14 ASD and ADHD does not mean that they have to be 15 etiologically relevant for everyone. Just like 16 smoking causes lung cancer, but that doesn't mean 17 that it's etiologically relevant for everyone.</p> <p>18 We know that high blood pressure is so 19 etiologically relevant for stroke on a 20 population-wide level, but that doesn't mean that 21 you can't have a stroke with very low blood 22 pressure.</p> <p>23 Sadly, it would be great, you know, if 24 just because a really strong exposure for an 25 outcome like hypertension and stroke meant that</p>	<p style="text-align: center;">Page 166</p> <p>1 you couldn't get stroke without it, that would 2 make -- that would make so many people like me who 3 don't have high blood pressure rest easy at night. 4 Then I could say, oh, guess what? I don't have 5 the ability to get stroke.</p> <p>6 Sadly, it does not work that way.</p> <p>7 MR. KLATT: Object to nonresponsiveness of 8 the answer.</p> <p>9 A. Do you want to ask the question in another 10 way?</p> <p>11 Q. Do you believe that lead and/or arsenic 12 exposure is a necessary cause of ASD and ADHD?</p> <p>13 A. I believe that lead and arsenic exposure 14 on a population-wide level causes ASD and ADHD.</p> <p>15 That does not mean that you can -- that 16 you need to be exposed to those to get autism and 17 ADHD. Just like what I was saying, you don't need 18 to have high blood pressure in order to get a 19 stroke. You don't need to smoke in order to get 20 lung cancer.</p> <p>21 We know that smoking is so important for 22 lung cancer, but that does not mean that it's -- 23 that it's necessary, that you can't get lung 24 cancer without smoking.</p> <p>25 It would be so great if that were true. I</p>
<p style="text-align: center;">Page 167</p> <p>1 mean, it would be so great if we could wipe out, 2 you know, lead and arsenic from baby food.</p> <p>3 We see that levels have decreased over 4 time because companies are getting more 5 responsible, but that doesn't mean that, you know, 6 if we completely wiped out lead and arsenic from 7 baby food that nobody is going to have arsenic -- 8 nobody is going to have ASD and ADHD.</p> <p>9 I don't think that that would be true.</p> <p>10 But they are so causally relevant that lead and 11 arsenic are causally associated with ASD and ADHD.</p> <p>12 Q. Let me follow up on that. If it were 13 feasible to make all baby foods commercially 14 produced or homemade baby foods completely lead 15 free, arsenic free, do you think that children, 16 infants, children, babies in utero, would still be 17 exposed to lead and arsenic from other sources in 18 the environment other than food?</p> <p>19 MR. ESFANDIARY: Objection, incomplete 20 hypothetical, calls for speculation.</p> <p>21 A. That's a hypothetical. I mean, it would 22 be great. You know, I hope one day -- I know that 23 the lead and arsenic levels are going down because 24 we know it's feasible. We know that companies 25 could have been reducing their levels of lead and</p>	<p style="text-align: center;">Page 168</p> <p>1 arsenic in baby food all along. It should not 2 have waited until recently to go down.</p> <p>3 But there's a long way to go. Baby food 4 is still contaminated with lead and arsenic. So 5 what you're describing is a hypothetical future 6 situation in which there needs to be lead and 7 arsenic removed from other things too.</p> <p>8 Would that happen simultaneously? Who 9 knows.</p> <p>10 Q. Is it your testimony that the only source 11 of lead and arsenic exposure to infants and young 12 children is from baby food and no other source? 13 Is that what you're testifying to today?</p> <p>14 A. I'll read you from my report because I 15 talk in my report about where lead can be found 16 and where arsenic can be found.</p> <p>17 Q. My question is other than baby food.</p> <p>18 A. Yes. I understand your question.</p> <p>19 So on page 33 of -- these have got 20 different labels. Now this says Gardener 2.</p> <p>21 Q. That's the correct exhibit number.</p> <p>22 A. Yeah. It just didn't have my name before.</p> <p>23 Now it has my name on there.</p> <p>24 Now in Exhibit Gardener 2, on page 39 of 25 my report.</p>

<p style="text-align: right;">Page 169</p> <p>1 Q. Hang on just a second. Let me get there. 2 Okay. Go ahead, Dr. Gardener. 3 A. On the bottom of page 33, lead is a heavy 4 metal found in many sources including paint, 5 pipes, ceramics, bullets, crystal, soldiers -- 6 soldiers -- 7 Q. Solder? 8 A. Yes, solder. 9 -- gasoline, antiques, and cosmetics and 10 contaminates soil, dust, water and food. 11 Q. So if we excluded arsenic and lead from 12 food, we'd still be all exposed, including infants 13 and children, to arsenic in soil, dust, and water. 14 Correct? 15 A. So what you're talking about is a 16 hypothetical future. We don't know. Maybe at 17 that time of that hypothetical future the other 18 sources would have been eliminated too. I hope we 19 get to see that time when the baby food 20 manufacturers, you guys are reducing the exposure. 21 The exposure has also been reduced in 22 other areas too; for example, paint and toys. The 23 exposure to lead from those sources are also 24 decreasing. 25 You're presenting a hypothetical future.</p>	<p style="text-align: right;">Page 170</p> <p>1 Q. I'm not presenting -- go ahead. I'm not 2 presenting anything hypothetical. I'm looking at 3 what you just read. 4 You said, "Lead is a heavy metal found in 5 many sources and it contaminates soil, dust, and 6 water." 7 That's apart from food. Correct? 8 A. Yes, but it's also -- and part of the 9 contamination of food is because of contamination 10 from soil and water. 11 Q. But -- 12 A. So, you know, it will be much harder to 13 eliminate it from food without eliminating it from 14 soil and dust. So you're talking about a 15 hypothetical future where we have figured out how 16 to totally eliminate it from food despite its 17 continued presence in soil and water. That's a 18 hypothetical. 19 Q. Well, let's ask about a real-world 20 example. 21 Can children, including infants, come into 22 direct contact with lead and arsenic from contact 23 with soil? 24 A. Children can and do come into contact with 25 lead from soil. And that's part of the reason why</p>
<p style="text-align: right;">Page 171</p> <p>1 they also come in contact with it from food, 2 because food is grown in soil. 3 MR. KLATT: Object to -- 4 Q. Go ahead. 5 A. It is possible that you have a 6 hypothetical child that doesn't eat. That doesn't 7 mean that that child is not going to be exposed to 8 heavy metals in soil. 9 Q. Okay. Listen to my question carefully, 10 Dr. Gardener. I'm simply asking about soil, not 11 about food. 12 Can a child, an infant crawling around, be 13 exposed to lead and arsenic from direct contact 14 with soil? 15 MR. ESFANDIARY: Objection, calls for 16 speculation, overbroad. 17 A. It depends on the child. But some 18 children are exposed to lead from soil. 19 Q. Are some children exposed to lead from 20 water? 21 A. Some children are exposed to lead from 22 water. 23 Q. Are some children exposed to arsenic from 24 water? 25 A. Some children are exposed to arsenic from</p>	<p style="text-align: right;">Page 172</p> <p>1 water. And again, both -- water is a contributor 2 to food, so that's part of the reason why food is 3 contaminated. 4 Q. For example, if water is used to make 5 infant formula, a child may be exposed to lead or 6 arsenic in the water used to make infant formula. 7 Correct? 8 A. Yes. So some of the infant formula, 9 those -- the jugs of infant formula, the source of 10 that lead or arsenic may be from the water or from 11 the ingredients outside the water, the formula 12 ingredients itself. 13 And same with food. They could be -- it 14 could be from different parts of the food, the 15 ingredients, including water. 16 Q. All right. But my question is confined to 17 simply water exposure. Can children be exposed to 18 lead and arsenic simply from coming into contact 19 with or ingesting water? 20 A. Some children are exposed to lead and 21 arsenic from water. Lead and arsenic are both 22 contaminants in some water sources, so children 23 can be exposed to lead and arsenic from water. 24 Q. Now let's look at the other example that 25 you read from your report, dust.</p>

<p style="text-align: center;">Page 173</p> <p>1 Can infants and children in the U.S. be 2 exposed to lead and arsenic through coming into 3 contact with dust, whether inside or outside the 4 home?</p> <p>5 A. Some children are exposed to lead and 6 arsenic inside and outside the home from dust.</p> <p>7 Q. I want to talk to you for a minute about 8 something that I brought to your counsel's 9 attention right before the lunch break, and that 10 was your testimony in front of the Rhode Island 11 Senate --</p> <p>12 MR. ESFANDIARY: Do you have an extra 13 copy?</p> <p>14 MR. KLATT: I do. In fact, the court 15 reporter courteously marked that as Exhibit 8. 16 (Exhibit 8 marked for identification)</p> <p>17 Q. First of all, let's establish, 18 Dr. Gardener, you recall testifying in front of 19 the Rhode Island State Senate in March of 2017 20 about brominated flame retardants?</p> <p>21 A. I do.</p> <p>22 Q. What brought that testimony about?</p> <p>23 A. So I was hired by an organization to 24 deliver this testimony. They -- I don't know what 25 the right words were. I don't know if they were</p>	<p style="text-align: center;">Page 174</p> <p>1 in support of the bill or they were a driving 2 force. I don't really -- I don't know really how 3 that all works. Its senate representatives, I 4 guess, are the ones that bring the bill forth.</p> <p>5 The organization Clean Water Rhode 6 Island -- I can't remember -- it was like Clean 7 Water Rhode Island or something. They found me 8 and they told me about this bill that they -- that 9 was going before the senate and the house in Rhode 10 Island about restrictions for -- that all 11 brominated -- yeah, all brominated flame 12 retardants. And they asked me to testify.</p> <p>13 Q. And were you put under oath? Do you 14 recall?</p> <p>15 A. Probably.</p> <p>16 Q. If you don't remember -- if you don't 17 remember --</p> <p>18 A. I think in those situations -- actually, I 19 don't actually recall whether you get put under 20 oath or not for that.</p> <p>21 Q. And you're aware that your statement is on 22 YouTube now?</p> <p>23 A. The video. There's a video of me.</p> <p>24 Q. Yes.</p> <p>25 A. That wonderful video of me. I had the</p>
<p style="text-align: center;">Page 175</p> <p>1 flu, so . . .</p> <p>2 Q. Have you reviewed it recently?</p> <p>3 A. I have watched bits of it and cringe 4 because I was so sick and I look quite ill, I 5 think.</p> <p>6 Q. Well, it wasn't apparent to me watching 7 it.</p> <p>8 I've transcribed it here. We can call it 9 up and go through it. It's about seven minutes.</p> <p>10 I'll represent to you that this is an 11 accurate transcription. And you're free to 12 disagree with anything here if you have a basis 13 now in 2025 to disagree.</p> <p>14 But I direct your attention to the third 15 paragraph. And you said back in 2017, "A 2011 16 study of baby products found that 80 percent of 17 products tested contained a halogenated flame 18 retardant additive."</p> <p>19 Do you recall that?</p> <p>20 A. Do I recall saying that sentence?</p> <p>21 Q. Yeah.</p> <p>22 A. No. That was eight years ago, so I don't 23 recall. I'm not disputing that I didn't say that.</p> <p>24 It's just a sentence I said eight years ago. I 25 don't remember if I said that sentence or not.</p>	<p style="text-align: center;">Page 176</p> <p>1 Q. Do you recall the 2011 study of baby 2 products that found 80 percent of them contained a 3 halogenated flame retardant additive?</p> <p>4 A. I do not recall that study.</p> <p>5 Q. And then you went on to say, "Flame 6 retardants are not physically bound to the 7 products in which they are applied. They migrate 8 out of the home products and into the air in homes 9 and accumulate in house dust."</p> <p>10 Is that an accurate statement, to your 11 knowledge, as we sit here today?</p> <p>12 MR. ESFANDIARY: Objection, beyond the 13 scope.</p> <p>14 A. That sentence makes a lot of sense to me. 15 I'm not here sort of prepared -- I did not think I 16 would be providing any opinions today about flame 17 retardants.</p> <p>18 Q. I'm just asking about opinions that you 19 expressed to the Rhode Island State Senate in 20 2017. You don't have any reason to dispute that, 21 do you?</p> <p>22 A. I don't have reason to dispute this. No.</p> <p>23 Q. And then you go on to say, "People are 24 exposed through inhalation, by ingesting with 25 ingestion when dust gets on our hands and</p>

<p style="text-align: center;">Page 177</p> <p>1 therefore into our mouths and through the skin."</p> <p>2 Correct?</p> <p>3 A. That's what this says. It sounds very</p> <p>4 inarticulate. But if that's how I said that,</p> <p>5 that's how I said that.</p> <p>6 Q. Is it true that lead and arsenic can get</p> <p>7 into the human body, whether in a child or an</p> <p>8 adult, through inhalation and by dust getting on</p> <p>9 their hands and into their mouths and through the</p> <p>10 skin?</p> <p>11 MR. ESFANDIARY: Objection, beyond the</p> <p>12 scope.</p> <p>13 MR. KLATT: I'm asking about lead and</p> <p>14 arsenic.</p> <p>15 MR. ESFANDIARY: I'm sorry. Go ahead.</p> <p>16 A. Inhalation, definitely. Dermal exposure</p> <p>17 at least for lead is more challenging. Inhalation</p> <p>18 is definitely an important exposure source. And I</p> <p>19 would say that's true for arsenic too. The data</p> <p>20 on dermal exposure with lead I would say is a</p> <p>21 little bit --</p> <p>22 MR. ESFANDIARY: Hey, Mike, we don't have</p> <p>23 to leave the room. I just need to use the</p> <p>24 restroom quickly.</p> <p>25 MR. KLATT: Do you want to go off the</p>	<p style="text-align: center;">Page 178</p> <p>1 record and take a break?</p> <p>2 MR. ESFANDIARY: Just two minutes. I</p> <p>3 don't want to eat up time here.</p> <p>4 THE VIDEOGRAPHER: That concludes the</p> <p>5 Media Number 3 [sic]. Going off the record at</p> <p>6 2:01 p.m.</p> <p>7 (Recess, 2:01 p.m. to 2:04 p.m.)</p> <p>8 THE VIDEOGRAPHER: This is the beginning</p> <p>9 of Media Number 5. Going back on the record,</p> <p>10 2:04 p.m.</p> <p>11 BY MR. KLATT:</p> <p>12 Q. Dr. Gardener, I'm picking up again after</p> <p>13 our short break with Exhibit 8, which is the</p> <p>14 transcription of your Rhode Island Senate</p> <p>15 testimony in March of 2017.</p> <p>16 And I'm going to the next sentence, which</p> <p>17 says, "Babies and children are more highly exposed</p> <p>18 as they spend more time crawling and playing on</p> <p>19 the floors and have increased hand-to-mouth</p> <p>20 contact." Correct?</p> <p>21 A. Correct.</p> <p>22 Q. And do you believe that to be true?</p> <p>23 A. Well, so I was talking about more exposed</p> <p>24 to halogenated flame retardant that migrates out</p> <p>25 of the products. And, I mean -- yeah. I'm not</p>
<p style="text-align: center;">Page 179</p> <p>1 disputing that.</p> <p>2 Q. Do you agree that babies and children are</p> <p>3 more highly exposed to both lead and arsenic as</p> <p>4 they spend more time crawling and playing on</p> <p>5 floors and have increased hand-to-mouth contact?</p> <p>6 A. That's definitely true. I mean, first of</p> <p>7 all, they're more exposed than adults in general,</p> <p>8 especially to lead.</p> <p>9 In this context, we tend to think about</p> <p>10 lead more in this context than arsenic. But to</p> <p>11 the extent that arsenic would be in house dust --</p> <p>12 basically, babies and children tend to be more</p> <p>13 exposed to house dust than adults because they're</p> <p>14 crawling around, they're playing more on the</p> <p>15 floor, and they have all this hand-to-mouth</p> <p>16 contact.</p> <p>17 Q. Are you aware of the EPA, federal</p> <p>18 government's EPA, stating that house dust is the</p> <p>19 most frequent source of lead exposure to infants</p> <p>20 and young children?</p> <p>21 A. Can you show me where that is?</p> <p>22 Q. Sure. Well, I will come to that. Let's</p> <p>23 finish up with Exhibit 8, and I'll come to that in</p> <p>24 a minute.</p> <p>25 And then going back to Exhibit 8 and</p>	<p style="text-align: center;">Page 180</p> <p>1 referring to your testimony about flame</p> <p>2 retardants, you say, "In addition, they" --</p> <p>3 meaning, I assume, babies and children -- "are</p> <p>4 also exposed through their breast milk."</p> <p>5 And you're talking about flame retardants</p> <p>6 there. Correct?</p> <p>7 A. Correct.</p> <p>8 Q. Is it also true that babies are exposed to</p> <p>9 lead and arsenic through breast milk, nursing?</p> <p>10 MR. ESFANDIARY: Objection, overbroad,</p> <p>11 calls for speculation.</p> <p>12 A. I would need to look -- I haven't looked</p> <p>13 at data at all recently about the amount of lead</p> <p>14 and arsenic in breast milk. But in general, those</p> <p>15 can be exposure sources depending on the</p> <p>16 mother's . . .</p> <p>17 Q. As part of formulating your opinions in</p> <p>18 this case, did your methodology include ruling out</p> <p>19 the role that lead or arsenic exposure in breast</p> <p>20 milk may play in what you believe to be children</p> <p>21 developing ASD or ADHD as a consequence of lead or</p> <p>22 arsenic exposure?</p> <p>23 A. I ruled it in. My opinion is that lead</p> <p>24 and arsenic exposure do -- are causally associated</p> <p>25 with ASD and ADHD. I didn't rule that out. I</p>

<p style="text-align: center;">Page 181</p> <p>1 ruled that in irrespective of their exposure 2 source.</p> <p>3 Q. Okay. And one exposure source would be 4 breast milk. Correct?</p> <p>5 A. It can be for some children. And plenty 6 of children don't breast-feed, so it really 7 depends -- it's a hypothetical.</p> <p>8 It depends on the amount of lead and 9 arsenic contamination in the breast milk, whether 10 the baby breast-feeds, how long, how much. But 11 yeah, absolutely. My opinion in this case is that 12 lead and arsenic are causally associated with 13 autism and ADHD.</p> <p>14 Q. And we earlier talked about how those 15 exposures to lead and arsenic can even occur to 16 children in the nine months that they're in the 17 womb before birth. Correct?</p> <p>18 MR. ESFANDIARY: Objection, overbroad, 19 calls for speculation.</p> <p>20 A. So we're switching away from breast -- so 21 they're not breast-feeding in the womb --</p> <p>22 Q. Absolutely.</p> <p>23 A. -- but they're still exposed to -- and 24 breast milk is made from the mother's blood and 25 they are exposed to the mother's blood.</p>	<p style="text-align: center;">Page 182</p> <p>1 I should say the blood of anyone who's 2 breast-feeding them. It does not necessarily need 3 to be their mother.</p> <p>4 So yes, when they are exposed to blood 5 from their mother in the womb, that can be 6 contaminated with lead and arsenic.</p> <p>7 Q. So babies in the United States or anywhere 8 in the world, for that matter, can be exposed to 9 lead and arsenic through the mother's blood for 10 the nine months of gestation and then for the 11 first three or four months of either infant 12 formula or breast-feeding before they ever 13 encounter baby food, solid baby food, whether 14 commercially prepared or homemade. Correct?</p> <p>15 MR. ESFANDIARY: Objection, overbroad.</p> <p>16 A. So I testified and studied the 17 contamination of infant formula with heavy metals. 18 And I think that that's absolutely health 19 relevant.</p> <p>20 It's not that lead and arsenic from 21 certain exposures are not important, not 22 etiologically relevant and they are etiologically 23 relevant from other exposures. It does not 24 matter. What matters is that they are exposed to 25 lead and arsenic.</p>
<p style="text-align: center;">Page 183</p> <p>1 Just like I study PFAS. And there's all 2 this accumulating evidence about all the 3 deleterious health effects of PFAS. Nobody, not 4 once in all of my talks, all the talks I've seen, 5 all of the talks I've given, all the conversations 6 I've had, the PFAS from the couches don't matter. 7 The PFAS from this chair, it doesn't matter. The 8 PFAS from this water doesn't matter.</p> <p>9 It's PFAS. It all matters. Nobody cares 10 from an etiological perspective where the PFAS is 11 coming from. That's not relevant.</p> <p>12 What's relevant is the exposure. How 13 much, what are the different types of PFAS 14 compounds, because there are thousands of them. 15 The exposure source, just like for lead and 16 arsenic, does not matter. It is that you are 17 being exposed, how much, when.</p> <p>18 Q. So let me go back to my question.</p> <p>19 For the nine months that a baby's in 20 gestation before birth and then for the four to 21 six months that the infant is alive and feeding 22 either through breast milk or infant formula 23 before it ever encounters commercial or homemade 24 baby food, for that 13- to 15-month period from 25 conception until it starts eating, he or she</p>	<p style="text-align: center;">Page 184</p> <p>1 starts eating commercial or homemade baby food, 2 that child is being exposed to lead and arsenic?</p> <p>3 A. First of all, some babies start eating 4 before four months, and a lot of babies wait until 5 long after four months to start eating baby food. 6 So I want to clarify that.</p> <p>7 But as I talked about in my -- written 8 about in my report and talked about today, there 9 are many sources of exposure for lead and arsenic.</p> <p>10 And my opinions are really centered around 11 postnatal exposure to lead and arsenic. But I 12 also brought in some discussion, although not as 13 rigorous as a whole report, on the impacts of 14 prenatal exposure to lead and arsenic, but I did 15 also bring that up.</p> <p>16 But it is clear that there are multiple 17 exposure sources, Number 1. And Number 2, the 18 exposure source doesn't matter.</p> <p>19 What matters is that the baby is being 20 exposed. And whether it's because they were 21 chewing the paint from the windowsill or if the 22 paint from the windowsill chipped off and was in 23 the dust and it got into their mouths from the 24 dust or from their food, it does not matter.</p> <p>25 What matters is their exposure. Nobody</p>

<p style="text-align: center;">Page 185</p> <p>1 outside of -- really cares about what the exposure 2 source is but rather how much is being exposed. 3 From an etiological perspective, where it 4 really matters what the exposure source is, the 5 exposure source matters in that it helps us figure 6 out where do we devote our energy to reduce and 7 eliminate the exposure.</p> <p>8 So it's not that it matters from the 9 health consequences but rather from the solution.</p> <p>10 Q. I think maybe you misunderstood my 11 question or got sidetracked. I have a very 12 specific question. I understand that you think 13 the source of lead or arsenic exposure doesn't 14 matter. I'd like to shift to the time frame of 15 lead and arsenic exposure.</p> <p>16 It is a true fact that babies in the 17 United States and around the world are exposed to 18 lead and arsenic for nine months during gestation 19 before they're even born and then for the two to 20 four to six months, however long before they ever 21 start eating either commercial or homemade baby 22 food. Correct?</p> <p>23 MR. ESFANDIARY: Objection, overbroad, 24 calls for speculation.</p> <p>25 A. So as I talked about in this report, baby</p>	<p style="text-align: center;">Page 186</p> <p>1 food is not the only exposure source to lead and 2 arsenic. Typically babies are exposed -- people 3 are exposed throughout their entire lives, 4 starting at conception. In general, there is 5 exposure.</p> <p>6 That does not mean -- just because you're 7 exposed prenatally does not mean that your 8 postnatal exposure to lead and arsenic is not 9 etiologically relevant, just like just because 10 you're exposed postnatally does not mean your 11 prenatal exposure is irrelevant.</p> <p>12 I've been in litigation about infant 13 formula. And they make this huge, big deal, oh, 14 the exposure to the infant formula doesn't matter.</p> <p>15 Our baby food is filled with lead and 16 arsenic. It's all -- the babies are not just -- 17 they're not just consuming infant formula. 18 They're also eating all this heavily contaminated 19 baby food as if -- that doesn't mean that the 20 contamination in infant formula is irrelevant.</p> <p>21 And I'll say that again in this situation. 22 Just because your breast milk and infant formula 23 and in utero exposures are present does not mean 24 that the exposure to baby food or in general to 25 children and babies is not etiologically relevant.</p>
<p style="text-align: center;">Page 187</p> <p>1 MR. KLATT: Object to the responsiveness 2 of the answer, everything after "there are many 3 sources of exposure for lead and arsenic."</p> <p>4 Q. Let's focus, if you would, Dr. Gardener -- 5 I'm focused on the time period. I understand your 6 opinion is there are a lot of different sources of 7 lead and arsenic exposure. I understand you 8 believe they can occur postnatally. I'm focused 9 on the time period.</p> <p>10 You agree with me that babies in the 11 United States and elsewhere are exposed to lead 12 and arsenic for the nine months of gestation 13 before birth and for the three, four, five, six 14 months before they ever encounter commercial baby 15 food. Correct?</p> <p>16 MR. ESFANDIARY: Objection, overbroad, 17 calls for speculation.</p> <p>18 Q. Focusing just on the time period.</p> <p>19 A. Sorry. Can you repeat the question? (Pending question read)</p> <p>20 A. Yes. So there's definitely, you know -- 21 for most children -- I can't say for every single 22 child out there. But in general, babies are 23 exposed to lead and arsenic prenatally.</p> <p>24 I talked about that in my report, studies</p>	<p style="text-align: center;">Page 188</p> <p>1 on prenatal exposure to lead and arsenic in 2 relation to ASD and ADHD as well as during 3 infancy.</p> <p>4 I've been involved in litigation about 5 heavy metal contamination in infant formula. And 6 it's not just infant formula. Babies and children 7 are exposed to heavy metals from other sources 8 during infancy as well.</p> <p>9 Q. And did you make any effort in the 10 methodology you used to come to your opinions in 11 this case to rule out these other sources of 12 exposure to lead and arsenic that babies and 13 infants have before they ever encounter commercial 14 baby food?</p> <p>15 A. So I talked about that in my report. I 16 talked about studies on prenatal exposure to lead 17 and arsenic. I considered that. I talked about 18 that. I talked about the fact that that -- that 19 it might -- the data from there might be slightly 20 outside of the etiologically relevant window that 21 we're talking about in this case. But it can help 22 inform our opinions about temporality.</p> <p>23 Q. We've already established today that the 24 gestation period an infant undergoes for nine 25 months is a critical time in terms of</p>

<p style="text-align: center;">Page 189</p> <p>1 neurodevelopment. Correct?</p> <p>2 A. There are neurodevelopmental processes</p> <p>3 that occur in utero as well as for years and years</p> <p>4 after birth.</p> <p>5 You know, there's neurogenesis going on</p> <p>6 right now. The stress that I'm feeling today is</p> <p>7 actually impacting my brain architecture and yours</p> <p>8 probably too. Maybe you're not as stressed out</p> <p>9 from this; this is part of your job. But all of</p> <p>10 these exposures actually impact our brain</p> <p>11 architecture and the metabolites in our brain and</p> <p>12 how our brains work.</p> <p>13 But the in utero period and during infancy</p> <p>14 and childhood is a period of rapid growth and</p> <p>15 development. And therefore, it can have a bigger</p> <p>16 role in terms of shaping brain and behavior.</p> <p>17 Q. Just to wrap up this question on time</p> <p>18 period. So it's true that it's typical for babies</p> <p>19 in the U.S. to be exposed to arsenic and lead for</p> <p>20 a full year, the nine months of gestation plus</p> <p>21 approximately three months postnatally, to lead</p> <p>22 and arsenic before they ever encounter baby food.</p> <p>23 Correct?</p> <p>24 A. Lead and arsenic are exposures that are</p> <p>25 really lifelong. It's starting with gestation.</p>	<p style="text-align: center;">Page 190</p> <p>1 What's typical is that babies are exposed in utero</p> <p>2 to lead and arsenic and other heavy metals and</p> <p>3 throughout all of life.</p> <p>4 Q. Let's go back and finish up with</p> <p>5 Exhibit 8, the testimony about the flame</p> <p>6 retardants.</p> <p>7 A. Okay.</p> <p>8 Q. And I'm going back to that same third</p> <p>9 paragraph on the first page.</p> <p>10 You say, "Brominated flame retardants are</p> <p>11 most notorious for their associations with</p> <p>12 impaired development and neurotoxicity." Correct?</p> <p>13 A. Yup. That's what I see here.</p> <p>14 Q. And is that a true fact?</p> <p>15 A. It's been eight years that the -- that</p> <p>16 sentence might not be as true anymore. They could</p> <p>17 be more notorious at this point -- in the past</p> <p>18 eight years, the research on cardiac toxicity</p> <p>19 could have ballooned.</p> <p>20 And maybe I would have written the</p> <p>21 sentence that way. It sounds like in 2017, it</p> <p>22 sounds like the most amount of research was, on</p> <p>23 brominated flame retardants was in relation to</p> <p>24 impaired development and neurotoxicity.</p> <p>25 Q. And are you aware of any research on</p>
<p style="text-align: center;">Page 191</p> <p>1 brominated flame retardants and neurotoxicity</p> <p>2 since 2017 that would change the statement you</p> <p>3 made to the Rhode Island Senate back then?</p> <p>4 A. Like whether since then we have found that</p> <p>5 they're actually not associated with impaired</p> <p>6 development and neurotoxicity?</p> <p>7 Q. Correct.</p> <p>8 A. I have not seen anything to refute that</p> <p>9 sentence since then, but it could be. I have not</p> <p>10 followed that literature as intently as I did when</p> <p>11 I was asked to do all the necessary research for</p> <p>12 this.</p> <p>13 Q. And the last sentence there, "Children who</p> <p>14 are more exposed in the womb and in infancy are</p> <p>15 more likely to be born preterm, with low birth</p> <p>16 weight, with suboptimal neonatal health, lower IQ,</p> <p>17 and exhibit impairments in cognition, motor</p> <p>18 skills, and behavior, including attention,</p> <p>19 impulsivity and anxiety."</p> <p>20 Did I read that correctly?</p> <p>21 A. Yes.</p> <p>22 Q. And is that true?</p> <p>23 A. Because it's a transcript, it sounds like</p> <p>24 it just came out of nowhere without references.</p> <p>25 But I think I did provide for this a</p>	<p style="text-align: center;">Page 192</p> <p>1 reference list. I think I had a written copy with</p> <p>2 references.</p> <p>3 But you know, I haven't followed this</p> <p>4 literature as intently to see how that literature</p> <p>5 has maybe strengthened since 2017 or more things</p> <p>6 to add.</p> <p>7 Q. Brominated flame retardants, the PFAS we</p> <p>8 talked about earlier, the phthalates, the</p> <p>9 endocrine disrupters that we talked about earlier,</p> <p>10 all those things are ubiquitous. They're all</p> <p>11 around us every day. Correct?</p> <p>12 A. Those are all endocrine disrupting</p> <p>13 chemicals. And they're all decreasing, like,</p> <p>14 substantially.</p> <p>15 So the amount of regulations in terms of</p> <p>16 brominated flame retardants since 2017 is just --</p> <p>17 I mean, this was written at a time when, like, all</p> <p>18 couches had brominated flame retardants.</p> <p>19 It was like, you know, 2025 was my dream</p> <p>20 at this time where it's pretty much impossible to</p> <p>21 find a couch with brominated flame -- I don't even</p> <p>22 know if anyone makes couches with brominated flame</p> <p>23 retardants.</p> <p>24 I was talking about brominated flame</p> <p>25 retardants and baby products. People aren't</p>

<p style="text-align: right;">Page 193</p> <p>1 adding brominated flame retardants to baby 2 products anymore. Not at all. 3 The amounts of exposure, at least in new 4 products, since 2017 has just plummeted. The 5 exposures to certain PFAS have plummeted based on 6 regulations. 7 Some PFAS are not as regulated. Their 8 exposures have stayed steady. Some have actually 9 increased. But like the two that had regulation, 10 PFOA, PFOS, they've plummeted but they still 11 remain prevalent because a lot of people have 12 older items in their home. 13 So it's not like the exposure is nothing, 14 that just because these things are regulated it's 15 nothing. 16 Just like heavy metals in baby food. Now 17 there's regulation, so the exposures are going to 18 decrease a lot. 19 That's the beauty of regulations is that 20 it protects us. Maybe not enough, but it does 21 protect us. 22 But still, I mean, there's no definition 23 of what the term "ubiquitous" is. But are 24 children still exposed to brominated flame 25 retardants? To varying degrees. Some kids, you</p>	<p style="text-align: right;">Page 194</p> <p>1 know, their homes, their mattresses, their 2 furniture, their electronics were all old and so 3 there's a lot of dust from brominated flame 4 retardants in their homes. So it's all of varying 5 degree, just like with lead and arsenic. 6 Children are exposed, babies are exposed 7 to varying amounts of lead and arsenic. 8 Q. Are you aware that people have raised the 9 issue whether exposure to brominated flame 10 retardants in the home are a cause of autism or 11 ADHD? 12 A. So I am not prepared to opine here about 13 that research like I can about lead and cadmium. 14 Trusting that your transcript was correct, 15 it does suggest that as of March 7th, 2017, there 16 was data to suggest that brominated flame 17 retardants was associated with many aspects of 18 neonatal health, including cognition, motor 19 skills, behavior, including attention, 20 impulsivity, and anxiety. 21 So those are all -- these are all topics 22 that I talk about in my report. 23 But the fact of the matter is, whether -- 24 the degree to which brominated flame retardants 25 play a causal role in autism and ADHD do not</p>
<p style="text-align: right;">Page 195</p> <p>1 detract from nor do they confirm my conclusions 2 that lead and arsenic are causally associated with 3 autism and ADHD. 4 If I did a thorough report on brominated 5 flame retardants in relation to autism and ADHD 6 and I found that, you know what, if a lawyer 7 called me today and said, you know, I want to 8 do -- I want to have a lawsuit about brominated 9 flame retardants in relation to autism and ADHD, 10 and I might find there's some evidence, but 11 there's not enough for me to say that, you know, 12 confidently under oath my conclusion from a 13 scientific perspective is that brominated flame 14 retardants are causally associated with autism and 15 ADHD. 16 And no lawyer has ever called me and asked 17 me that. But if they did, I would go through a 18 rigorous process. But that would not mean that 19 this report on lead and arsenic would either be 20 more valid or less valid because brominated flame 21 retardants can be causally associated with ASD and 22 ADHD even while lead and arsenic are too. 23 Or we could find that they're not causally 24 associated. That doesn't mean that lead and 25 arsenic can't be. They're distinct compounds.</p>	<p style="text-align: right;">Page 196</p> <p>1 MR. KLATT: Object to the responsiveness 2 of the answer. After everything "I'm not prepared 3 to opine here about that research," I move to 4 strike it. 5 Q. Do you remember what my question was? 6 A. Do you want to read it again? 7 Q. Sure. Are you aware that people have 8 raised the issue whether exposure to brominated 9 flame retardants in the home are a cause of autism 10 or ADHD? 11 A. So I haven't reviewed that literature very 12 carefully. This sentence implies that there is -- 13 that there is sort of speculation about that. 14 I mean, we're talking about attention, 15 impulsivity. Those are hallmarks of ADHD. 16 Q. Okay. 17 A. But at the same time, the fact that I 18 didn't include autism and ADHD here suggests that 19 maybe that research wasn't there in 2017. 20 Q. Do you think -- as a scientist involved in 21 issues of environmental causes of neurologic 22 diseases, do you think it's worthwhile for the 23 potential of brominated flame retardants to cause 24 autism or ADHD is worth scientific study? 25 A. I mean, I think -- so I think what your</p>

<p style="text-align: center;">Page 197</p> <p>1 question is -- as someone who reviews NIH grants, 2 you know, if I saw an NIH grant where someone was 3 looking at this association, whether I would think 4 that it was of high merit would partly depend on 5 the scientific rigor of it.</p> <p>6 I mean, I think we need to better 7 understand -- I still think we need to better 8 understand the health effects of all types of 9 brominated flame retardants even though their 10 exposure sources are decreasing.</p> <p>11 Some people might say we're regulating it 12 so much and it's decreasing, it's less relevant. 13 We already know that -- we know that they're 14 harmful.</p> <p>15 Just because we know that compounds are 16 harmful does not mean that we don't want to still 17 understand all of their causes. We know that lead 18 and arsenic are so, so, so toxic.</p> <p>19 But that doesn't mean that, oh, once we've 20 decided that then we don't keep continuing to 21 research that. Just because we know that PFAS are 22 so harmful doesn't mean that we don't want to 23 better understand whether they also cause 24 dementia. Just because we know they cause certain 25 cancers and have immune consequences doesn't mean</p>	<p style="text-align: center;">Page 198</p> <p>1 we don't also need to understand whether they 2 cause dementia or not.</p> <p>3 Q. Do you remember my question?</p> <p>4 A. Yeah.</p> <p>5 Q. Do you remember I asked you if it's 6 worthwhile for the potential cause of -- 7 brominated flame retardants with relationship to 8 ADHD or ASD is worth studying?</p> <p>9 A. Yeah. That was my answer to that 10 question.</p> <p>11 Q. I didn't ask you anything about lead or 12 arsenic or even PFAS. I was specifically focusing 13 on brominated flame retardants.</p> <p>14 You would agree with me it's worth 15 scientific study to see whether those ubiquitous 16 chemicals can potentially cause or contribute to 17 autism and ADHD. Correct?</p> <p>18 A. I guess I wasn't -- I didn't come prepared 19 to opine on what people should or should not 20 research, what different funding agencies should 21 or should not fund.</p> <p>22 I don't have personal plans to study this. 23 But if someone came to me and said, you know, I'm 24 going to conduct a big study on brominated flame 25 retardants and ASD, I won't be like, Don't do</p>
<p style="text-align: center;">Page 199</p> <p>1 that, we don't need that.</p> <p>2 But at the same time, I haven't kept up 3 with that research to say where are the gaps? 4 Where are the gaps? Where should you focus? What 5 should you do?</p> <p>6 Q. And if somebody came to you with a 7 scientifically appropriate grant proposal to study 8 the effects of PFAS as a potential cause of autism 9 and ADHD or ASD and ADHD, you'd think that's 10 worthy of study as well. Correct?</p> <p>11 A. It would depend on the study. I'd have to 12 look at it. I'd have to -- I'm not about to -- 13 I'm not inclined to shoot down anyone's idea of 14 what to study.</p> <p>15 And when I review grants for NIH, which 16 they ask me to do, it's not my role to say what 17 doesn't deserve to be studied. I have no plans to 18 study that, if that's what you're asking me about.</p> <p>19 Q. No.</p> <p>20 A. Nobody has asked me to study that. And I 21 would need to review that literature really 22 carefully in order to identify what are the gaps, 23 what gaps do we need to fill, like I did in terms 24 of PFAS and dementia, for example.</p> <p>25 Q. My question is very simple.</p>	<p style="text-align: center;">Page 200</p> <p>1 As someone whose work has centered around 2 environmental causes of neurologic diseases, do 3 you think the subject of PFAS's potential 4 causative relationship to ASD or ADHD is worth 5 scientific study?</p> <p>6 A. I think studying all environmental risk 7 factors for ASD and ADHD are important. That's 8 why I'm here today talking about the fact that 9 lead and arsenic are causally associated with ASD 10 and ADHD.</p> <p>11 I mean, if I didn't think that advocating 12 and understanding these associations were 13 important, I wouldn't be here.</p> <p>14 Q. What other environmental causes, in your 15 opinion, apart from the heavy metals lead and 16 arsenic, are potential causes of ASD and ADHD?</p> <p>17 MR. ESFANDIARY: Objection, beyond the 18 scope.</p> <p>19 A. So I'm here prepared under oath to talk 20 about lead and arsenic and ASD and ADHD. I have 21 written about -- I have a book chapter. I've 22 written about some other environmental risk 23 factors for ASD.</p> <p>24 But I am not here to opine, I haven't 25 rigorously written about those ones like I have</p>

<p style="text-align: center;">Page 201</p> <p>1 for lead and arsenic.</p> <p>2 So I would say I'm not here to -- I'm not</p> <p>3 prepared to really opine about the literature of</p> <p>4 the other risk factors.</p> <p>5 Q. And what were the other risk factors for</p> <p>6 ASD that you've previously written about?</p> <p>7 A. So I wrote about prenatal complications,</p> <p>8 prenatal, perinatal, and neonatal complications.</p> <p>9 Q. Such as?</p> <p>10 A. Cesarean birth.</p> <p>11 Q. Is that a risk factor for ASD and ADHD?</p> <p>12 A. I don't recall exactly the -- what I said</p> <p>13 about it. I'd have to look. And it was a while</p> <p>14 ago.</p> <p>15 The literature, I did a meta-analysis.</p> <p>16 The effect estimates may have changed, the</p> <p>17 literature could have evolved. I'm not here to</p> <p>18 speak confidently about the entire up-to-date</p> <p>19 literature on those other risk factors for ASD and</p> <p>20 ADHD.</p> <p>21 Q. And you're talking about other</p> <p>22 environmental risk factors for ADHD and ASD?</p> <p>23 A. I think that's what you just asked me</p> <p>24 about.</p> <p>25 Q. Okay. I just wanted to make sure that's</p>	<p style="text-align: center;">Page 202</p> <p>1 what we were talking about. Correct?</p> <p>2 A. That's what we're talking about today.</p> <p>3 Yeah.</p> <p>4 Q. Is it your opinion, Dr. Gardener, that</p> <p>5 baby food with any level of lead or arsenic is</p> <p>6 capable of causing ASD or ADHD in some children?</p> <p>7 A. So as long as the baby food has lead or</p> <p>8 arsenic, it will contribute or can contribute to</p> <p>9 the body burden of the lead and arsenic to babies</p> <p>10 who consume it.</p> <p>11 And what we have seen is that there is no</p> <p>12 safe level of lead. There's no threshold below</p> <p>13 which we can confidently say that those levels --</p> <p>14 on a population-wide basis, that exposure level to</p> <p>15 lead or arsenic is irrelevant.</p> <p>16 But whether it causes or contributes to</p> <p>17 the ASD or ADHD for any individual child, that's</p> <p>18 beyond my scope and that really more relates to</p> <p>19 the individual circumstances of that child.</p> <p>20 How much of that baby food was consumed,</p> <p>21 when, what are the specific circumstances, the</p> <p>22 health history and, like, all the factors that go</p> <p>23 into that child's ability to metabolize and</p> <p>24 detoxify those metals and that whole health</p> <p>25 history, that relates to specific causation, which</p>
<p style="text-align: center;">Page 203</p> <p>1 is beyond my scope.</p> <p>2 Q. But assume with me that you had one jar</p> <p>3 of, say, peaches that had an average amount of</p> <p>4 lead in it. Let's say 5 parts per billion. Is it</p> <p>5 your testimony that that one jar of peaches,</p> <p>6 5 parts per billion of lead, is capable of causing</p> <p>7 autism or ADHD -- ASD or ADHD, in some population</p> <p>8 of children?</p> <p>9 MR. ESFANDIARY: Objection, incomplete</p> <p>10 hypothetical.</p> <p>11 A. First, it needs to be consumed. Just</p> <p>12 sitting on the shelf --</p> <p>13 Q. Of course.</p> <p>14 A. So first of all, it needs to be consumed.</p> <p>15 And you need to know how much of it is consumed,</p> <p>16 when is it consumed, by whom is it consumed.</p> <p>17 On a population-wide level, if that baby</p> <p>18 food is consumed, it's going to impact the body</p> <p>19 burden of lead and arsenic in the babies or</p> <p>20 children who consume it. The more they consume</p> <p>21 it, the more their exposure, the more it will</p> <p>22 contribute to their body burden.</p> <p>23 And what we know is that in the literature</p> <p>24 there is a no safe level of these highly toxic</p> <p>25 contaminants that has been established.</p>	<p style="text-align: center;">Page 204</p> <p>1 And what the literature shows is that a</p> <p>2 higher exposure increases risk. But the degree of</p> <p>3 risk will depend on, you know, for example, how</p> <p>4 much is consumed. And whether it's etiologically</p> <p>5 relevant for a specific child will depend on that</p> <p>6 specific child's determinants.</p> <p>7 For me, I could have eaten -- my children,</p> <p>8 they could have eaten that jar of baby food all</p> <p>9 day every day and they might not have gotten</p> <p>10 autism. Children vary in terms of their</p> <p>11 proclivity and their vulnerability to these</p> <p>12 environmental toxins.</p> <p>13 We know that smoking causes lung cancer,</p> <p>14 but there are plenty of people that smoke all day</p> <p>15 every day for their entire lives and never get</p> <p>16 lung cancer. Because just like the case here,</p> <p>17 people vary in terms of their susceptibility to</p> <p>18 get an outcome that's associated with the</p> <p>19 exposure.</p> <p>20 Q. Is smoking one cigarette sufficient to</p> <p>21 cause lung cancer?</p> <p>22 A. It depends on the person. I mean, what we</p> <p>23 know is that smoking causes DNA damage. The more</p> <p>24 you smoke, the higher your risk. So there are</p> <p>25 people out there who smoking one cigarette may be</p>

<p style="text-align: center;">Page 205</p> <p>1 causally associated with their lung cancer. Other 2 people smoke all day every day, never get lung 3 cancer.</p> <p>4 People vary in terms of their proclivity. 5 And we know that no amount of smoking -- you're 6 not supposed to smoke any cigarettes.</p> <p>7 There's no amount of lead that's safe. 8 There's no amount of arsenic that's safe.</p> <p>9 Q. So there are some children out there that 10 could consume a single jar or a single pouch of 11 baby food that has lead in it and that could cause 12 their autism or ADHD. Correct?</p> <p>13 MR. ESFANDIARY: Objection.</p> <p>14 Q. Just like you said with one cigarette 15 causing lung cancer.</p> <p>16 MR. ESFANDIARY: Incomplete hypothetical.</p> <p>17 A. It depends on that child and their 18 circumstances. That's really an issue of specific 19 causation.</p> <p>20 Q. But I'm asking -- I realize there can be 21 one child somewhere that is uniquely sensitive to 22 something. But I'm talking about on a population 23 level where we're talking about literally millions 24 of kids eating baby food.</p> <p>25 Do you think that there are some children</p>	<p style="text-align: center;">Page 206</p> <p>1 within that population that would develop autism, 2 ASD, or ADHD from consuming one jar or one pouch 3 of baby food that has some content of lead in it? 4 5 parts per billion?</p> <p>5 A. You just answered your question. You just 6 said at the beginning of your question, you said 7 "I know that there's some child out there."</p> <p>8 So I'm going to agree with, you know, what 9 you said. You said you know -- yes. Children 10 differ in their susceptibility. And baby food 11 needs to be safe for the population.</p> <p>12 There are many kids out there who would 13 appear fine even if their house paint is filled 14 with lead.</p> <p>15 I grew up in a house where the paint was 16 filled with lead. I made it to Harvard, graduated 17 with almost perfect grades. Made it to Dartmouth, 18 graduated with almost perfect grades.</p> <p>19 That does not mean that the amount of lead 20 that was really high in the house paint in the 21 house that I grew up in was safe. That doesn't 22 mean that paint companies should be like, we don't 23 need to take the lead out of house paint. Look at 24 Hannah. Look how great she did. Look at how 25 great she's doing at this deposition today even</p>
<p style="text-align: center;">Page 207</p> <p>1 with all the lead that she was exposed to. That's 2 not how it works. It probably also gave me a 3 little anxiety today too. But whatever.</p> <p>4 We need to make these products safe for 5 the population in general. We took lead out of 6 house paint because it was dangerous for the 7 population, because there were so many other 8 people that could not have -- that had more 9 vulnerability that I had for whatever reason to 10 that -- the lead in that house paint.</p> <p>11 And the same needs to be true for other 12 exposures too. Just because plenty of kids ate 13 tons of baby food and do not end up autistic does 14 not mean that lead in baby food does not cause 15 autism.</p> <p>16 Q. Are you offering an opinion in this case 17 on the dose of lead or arsenic that increases the 18 risk in some children?</p> <p>19 A. So my opinions are all laid out here. My 20 opinions, I agree with the scientific consensus 21 from so many organizations. The American Academy 22 of Pediatrics, the CDC, the FDA, the WHO, every 23 major scientific body has said there's no safe 24 level of lead. And I agree with that.</p> <p>25 Maybe one day we will find that there's</p>	<p style="text-align: center;">Page 208</p> <p>1 exposure that -- there's tiny, tiny exposures that 2 people really today are not exposed to that 3 actually are not deleterious. But based on the 4 current environmental landscape and all of the 5 scientific literature, there is no safe level of 6 lead.</p> <p>7 There's no level that we see in the 8 literature where we can confidently say that 9 exposure is safe from an autism perspective. We 10 see that the higher the dose, the increased risk 11 of ADHD and ASD.</p> <p>12 My charge was not to give a dose that was 13 safe. I would not have been able to do so.</p> <p>14 My charge related to whether the exposure 15 sources from baby food in these hypothetical menus 16 and from what I know about heavy metals in baby 17 food, whether that's meaningful, whether -- 18 because if it was not meaningful, then this would 19 not be meaningful.</p> <p>20 This was a part of my charge and my task 21 that was really added this time around to say, 22 like, is this a relevant exposure source.</p> <p>23 And we do know it is a relevant exposure 24 source. For a large portion of kids, food is 25 their primary exposure source.</p>

<p style="text-align: center;">Page 209</p> <p>1 MR. KLATT: Okay. Why don't we take a 2 break.</p> <p>3 THE VIDEOGRAPHER: This concludes Media 4 Number 5. Going off the record, 2:47 p.m. 5 (Recess, 2:47 p.m. to 3:04 p.m.) 6 (Exhibit 9 marked for identification)</p> <p>7 THE VIDEOGRAPHER: This is the beginning 8 of Media Number 6. Going back on the record, 9 3:04 p.m.</p> <p>10 BY MR. KLATT:</p> <p>11 Q. Dr. Gardener, I think you joked earlier 12 about how the deposition was stressful for you. 13 Does that in any way interfere with your ability 14 to give full, complete, and truthful answers to my 15 questions today?</p> <p>16 A. I don't think so.</p> <p>17 Q. Okay. I'll show you what is marked as 18 Exhibit 9. I alluded to it earlier. It's from 19 the EPA website on biomonitoring for lead. Do you 20 see Exhibit 9 there?</p> <p>21 A. I do.</p> <p>22 Q. I'm just looking at the very first 23 paragraph. It says, "Lead is a naturally 24 occurring metal used in production of fuels, 25 paints, ceramic products, batteries, solder, and a</p>	<p style="text-align: center;">Page 210</p> <p>1 variety of consumer products. The use of leaded 2 gasoline in lead-based paint was eliminated or 3 restricted in the United States. However, 4 children continue to be exposed to lead due to the 5 widespread distribution of lead in the 6 environment."</p> <p>7 Do you see that?</p> <p>8 A. I do.</p> <p>9 Q. And I think earlier I had indicated the 10 EPA said something about exposure to house dust.</p> <p>11 So if you would turn -- probably the 12 easiest way to do this is to go from the back, 13 four pages from the back. It looks like this. It 14 says, "About the lead indicators."</p> <p>15 A. Yup.</p> <p>16 Q. Do you see that page?</p> <p>17 A. I do.</p> <p>18 Q. And I'm looking at the second paragraph 19 under "About the lead indicators."</p> <p>20 And it said -- EPA says, "Lead is a 21 naturally occurring metal used in the production 22 of fuels, paints, ceramic products, batteries, 23 solder, and a variety of consumer products."</p> <p>24 Do you have any reason to disagree with 25 that?</p>
<p style="text-align: center;">Page 211</p> <p>1 A. I mean, it's a little weird to say it's 2 naturally occurring in batteries since batteries 3 aren't really natural materials. But it is what 4 it is. Yeah. The sentence is --</p> <p>5 Q. Lead is an element. Correct?</p> <p>6 A. That's true.</p> <p>7 Q. In that sense, it's naturally occurring. Correct?</p> <p>8 A. Okay. I mean, I think it's weird to say 9 that in this synthetic product something is 10 natural.</p> <p>11 Q. I don't want to get into a debate with 12 you. It says it's a naturally occurring metal, 13 which it is, used in the production of these 14 things. Correct?</p> <p>15 A. Uh-hmm. Yes. Correct.</p> <p>16 Q. And you would agree with that?</p> <p>17 A. Yes.</p> <p>18 Q. It is --</p> <p>19 A. Yes.</p> <p>20 Q. And then it says, "The use of leaded 21 gasoline and lead-based paint was eliminated or 22 restricted in the United States beginning in the 23 1970s, resulting in substantial reductions in 24 exposure to lead." Correct?</p>	<p style="text-align: center;">Page 212</p> <p>1 A. Correct.</p> <p>2 Q. And is that consistent with your 3 understanding as well?</p> <p>4 A. Yes.</p> <p>5 Q. Meaning all of us who were born before the 6 1970s were exposed to massive amounts of lead. 7 Correct?</p> <p>8 A. Well, people varied in how much they were 9 exposed to in the past. And currently, there are 10 people today who are exposed to more than people 11 who were born in 1950. But as a population, the 12 lead levels have decreased.</p> <p>13 Q. Do you have any idea how much the blood 14 lead levels on average in children have decreased 15 in the United States from the 1970s to the 2020s?</p> <p>16 A. The amount -- like, the population 17 averages, I don't know, off the top of my head. It's been substantial.</p> <p>18 Q. The next sentence says, "However, children 19 continue to be exposed to lead due to the 20 widespread distribution of lead in the 21 environment." Do you see that?</p> <p>22 A. I do.</p> <p>23 Q. And I think you've talked about that earlier. Correct?</p>

<p style="text-align: right;">Page 213</p> <p>1 A. Correct.</p> <p>2 Q. Currently in the United States the major</p> <p>3 source of early childhood lead exposure is</p> <p>4 lead-contaminated house dust. Do you see that?</p> <p>5 A. I do see that.</p> <p>6 Q. And a major contributor to lead in house</p> <p>7 dust is deteriorated or disrupted lead-based</p> <p>8 paint. Do you see that?</p> <p>9 A. I do.</p> <p>10 Q. Do you have any reason to disagree with</p> <p>11 the EPA that currently in the United States a</p> <p>12 major source of early childhood lead exposure is</p> <p>13 lead-contaminated house dust?</p> <p>14 A. I would definitely say that a major source</p> <p>15 is lead-contaminated house dust.</p> <p>16 But, as I talked about in my report, there</p> <p>17 have been many recent studies that have shown that</p> <p>18 for the majority of children who are at the lower</p> <p>19 end of the spectrum of lead that food is the</p> <p>20 biggest contributor to their body lead burden.</p> <p>21 Q. Do you know what studies you're referring</p> <p>22 to?</p> <p>23 A. I can pull up an example. I'm looking.</p> <p>24 So here is one example. The Zartarian,</p> <p>25 et al., paper from 2017.</p>	<p style="text-align: right;">Page 214</p> <p>1 Q. What page of your report are you referring</p> <p>2 to?</p> <p>3 A. Page 85.</p> <p>4 Q. Okay. Go ahead.</p> <p>5 A. So the majority of children age 1 to 6,</p> <p>6 food is the primary contributor to blood lead</p> <p>7 levels.</p> <p>8 Q. I'm sorry. Where are you reading?</p> <p>9 A. The first sentence under 2, under "Lead."</p> <p>10 "Likewise, the consumption of food has</p> <p>11 long been recognized to be a relevant exposure</p> <p>12 source for lead. And for the majority of children</p> <p>13 age 1 to 6, food is the primary contributor to</p> <p>14 blood lead levels."</p> <p>15 And the citation for this was Zartarian,</p> <p>16 et al., 2017.</p> <p>17 Q. Is it true that homemade baby food is a</p> <p>18 source of lead and arsenic exposure?</p> <p>19 A. Sorry. We're switching gears suddenly. I</p> <p>20 was just like -- I was expecting . . .</p> <p>21 Q. You're talking about food exposure?</p> <p>22 A. Yeah.</p> <p>23 Q. I'm wondering, that can be any foods,</p> <p>24 whether it's commercial baby food, whether it's</p> <p>25 store-bought food, homemade baby food. In your</p>
<p style="text-align: right;">Page 215</p> <p>1 opinion, it can all be a source of lead or arsenic</p> <p>2 exposure. Correct?</p> <p>3 A. Homemade baby food can also be an exposure</p> <p>4 source for lead and arsenic.</p> <p>5 I don't recall them breaking this up in</p> <p>6 the Zartarian 2017 paper. But if you have it, we</p> <p>7 can take a look. But what they talked about --</p> <p>8 and there are other references to -- this was the</p> <p>9 easiest one for me to find -- for the majority of</p> <p>10 young children food is the primary contributor to</p> <p>11 blood lead levels.</p> <p>12 Q. Is it -- let me ask you this.</p> <p>13 In your report, did you review, evaluate,</p> <p>14 and consider longitudinal studies of the total</p> <p>15 diet of early childhood, not specific nutrients</p> <p>16 but the entire diet and diet quality and how it</p> <p>17 relates to subsequent neurocognitive outcomes?</p> <p>18 Are you aware of any studies like that?</p> <p>19 A. So you're talking about did I include</p> <p>20 studies in this report about sort of food diet</p> <p>21 behaviors in relation to neurocognitive outcomes?</p> <p>22 I don't recall any citations to that in</p> <p>23 this report. It was more in relation to diet as</p> <p>24 it relates to or as it interacts with heavy</p> <p>25 metals.</p>	<p style="text-align: right;">Page 216</p> <p>1 Q. But I'm just asking whether you saw any</p> <p>2 studies in your review or considered any studies</p> <p>3 longitudinally that looked at what were the diets</p> <p>4 of children, say, at six months, twelve months,</p> <p>5 and then looked subsequently a few years later to</p> <p>6 see whether the quality of the diet related to</p> <p>7 their neurocognitive outcomes for better or worse?</p> <p>8 A. So irrespective of heavy metals, what's</p> <p>9 the association --</p> <p>10 Q. Correct.</p> <p>11 A. -- between dietary patterns and</p> <p>12 neurocognitive outcomes, you said?</p> <p>13 Q. Exactly right.</p> <p>14 A. I'm not prepared to offer an opinion on</p> <p>15 that.</p> <p>16 Q. Did you review any studies about that in</p> <p>17 preparation for your opinions in the case?</p> <p>18 A. In relation -- did it impact my opinions</p> <p>19 in this case? No.</p> <p>20 Q. Did you evaluate any studies of that?</p> <p>21 A. So there were some studies that did look</p> <p>22 at diet and diet patterns. But for this, I</p> <p>23 related it more to as it could interact with heavy</p> <p>24 metals.</p> <p>25 Q. Did you see in these studies that you</p>

<p style="text-align: center;">Page 217</p> <p>1 considered, did you cite any in your report? 2 A. Yes. So I talked about -- the report is 3 so long now. 4 So for example, if you go to page 100. 5 Q. Go ahead. 6 A. So a few studies have tried to directly 7 address the question about whether simultaneous 8 dosing of nutrients from food impacts lead -- body 9 lead burden. These studies have not addressed the 10 interactions between nutrients from food and lead 11 and neurodevelopment. 12 This is Kordas, et al., 2018. And they 13 conducted a cross-sectional study of children age 14 5 to 8 in Uruguay that included two 24-hour 15 recalls, and they looked at the associations 16 between consumption of several nutrients and foods 17 with blood and urine lead concentrations. 18 They found that dietary intake of iron, 19 vitamin C, and zinc were unassociated with lead 20 biomarkers. 21 In addition to these findings for iron, 22 vitamin C, and zinc, the results also showed no 23 associations for the consumption of iron-rich 24 foods or vitamin C-rich foods. 25 Calcium and milk or dairy intake were</p>	<p style="text-align: center;">Page 218</p> <p>1 associated with lower urine lead levels with 2 statistical significance and lower blood lead 3 levels without statistical significance. 4 And the results showed the intake of 5 calcium explained most of the association from 6 milk and dairy with urine lead concentrations, as 7 the associations for milk and dairy became 8 nonsignificant when dietary calcium was included 9 in the models. 10 These findings lead the authors to 11 conclude that in contrast to individual nutrients, 12 some of which had been found to impair the 13 intestinal absorption of lead, little evidence is 14 available in which foods, food groups, or dietary 15 patterns could effectively prevent lead exposure 16 or lower children's blood lead levels. 17 Despite the fact that this study was 18 cross-sectional and contradictory, most of the 19 supplementation trials on calcium were still 20 informative and contributed to my opinions. 21 Q. I see that you didn't quote from Kordas 22 their statement that aside from the question of 23 whether extrapolations can be made to children, 24 these studies clearly indicate that studying 25 single nutrients does not approximate food dietary</p>
<p style="text-align: center;">Page 219</p> <p>1 consumption and its effect on lead absorption. 2 So did you evaluate any studies that 3 considered food and dietary consumption as a whole 4 in outcome as opposed to focusing on specific 5 nutrients? 6 A. Yes. This study did -- this study did 7 both. It looked at food and nutrients. 8 It would be assumed that any contribution 9 to the foods would be through these nutrients, 10 which have been hypothesized at least on a 11 cellular level to compete with each other. 12 But the question would be even if these -- 13 on a cellular level these nutrients compete with 14 each other, the question would still remain. 15 If we did find that, which as I laid out 16 in this report we really don't have strong 17 evidence for, the question would be, all right, 18 when it's diluted in a food, does that matter? 19 Like, the calcium question I think is 20 really relevant because there's so many warnings 21 about lead contamination in calcium supplements. 22 If calcium was the answer to lead, we 23 wouldn't be getting warnings about lead 24 contamination in calcium supplements themselves. 25 In fact, that's one of the big sort of lead</p>	<p style="text-align: center;">Page 220</p> <p>1 warnings out there. 2 Q. Do you recall that Kordas also said 3 opinions may vary, but it seems prudent to adhere 4 to current recommendations with the understanding 5 that they represent a benefit for children's 6 nutritional status. 7 The guidelines on iron-rich foods or iron 8 supplements to correct existing iron deficiency in 9 children exposed to lead, especially in children 2 10 to 3 years old or younger who are growing rapidly 11 and have high physiological demands for iron, may 12 be particularly important. 13 MR. ESFANDIARY: And just for the record, 14 Counsel is reading from a study by Kordas that he 15 has not marked as an exhibit and is not in front 16 of Dr. Gardener. 17 MR. KLATT: I'm happy to mark it as an 18 exhibit. 19 A. So your question was do I recall sentences 20 in a paper? No, I do not recall the sentences. 21 Q. That you quoted in your report. 22 A. I don't recall sentences in any of the 23 papers that I have included in my report, 24 including my own papers. So any paper, I would 25 need to --</p>

<p style="text-align: center;">Page 221</p> <p>1 Q. I'll show you that in just a minute. 2 Before I get to that, let me ask you this: 3 When evaluating potential heavy metal exposures, 4 the heavy metal exposures studies that you relied 5 on involving postnatal heavy metal levels, to what 6 extent did you also consider as part of your 7 methodology prenatal heavy metal exposure that 8 we've established will occur in almost every 9 child?</p> <p>10 A. For example, on page 22 I wrote, "For the 11 same reason, I included in my literature reviews 12 studies on prenatal exposure to heavy metals. The 13 prenatal period represented a different 14 etiological period from the one in question in 15 this legal matter. However, I found this 16 literature highly informative in this case because 17 it also allayed my concerns about temporality and 18 reverse causation in addition to helping me 19 understand biological plausibility.</p> <p>20 "As an example, in the early autism risk 21 longitudinal investigation, increased blood lead 22 levels during pregnancy were associated with an 23 increased risk of ASD, though there was no 24 association for urine lead levels."</p> <p>25 And then in each section --</p>	<p style="text-align: center;">Page 222</p> <p>1 Q. So -- 2 MR. ESFANDIARY: Don't interrupt. 3 Q. I wanted to ask you about that particular 4 study. I'm sorry. Were you finished? 5 A. So you had asked me how -- to what extent 6 I considered it. And so I figured I'd point out 7 the places in my report where I discussed it. 8 Q. I know that you cited in your report 9 studies of prenatal lead exposure and its 10 relationship to the outcomes of ASD or ADHD. 11 But how did you take those studies into 12 account when considering and citing the postnatal 13 studies of lead and arsenic? 14 A. So I took them into account because what 15 they did is they helped allay my concerns about 16 potential for reverse causation. They helped 17 inform my questions about temporality. 18 Q. Well, if a child is exposed prenatally, 19 then obviously if you look at that child 20 postnatally for their lead levels, you can't 21 distinguish whether that exposure occurred pre- or 22 postnatally. Correct? 23 MR. ESFANDIARY: Objection, vague and 24 ambiguous. 25 Q. All right. We've established today that</p>
<p style="text-align: center;">Page 223</p> <p>1 almost all children are exposed prenatally to lead 2 and arsenic. 3 You've cited studies in your report that 4 prenatal lead in some studies has been associated 5 with the outcomes of ASD and ADHD. Correct? 6 A. Yeah. I would say that the overall 7 literature is not as strong and compelling in 8 terms of prenatal. There haven't been as many 9 studies relating prenatal exposure to autism and 10 ADHD as compared to postnatal. But I still did 11 take that into consideration. 12 Q. How? 13 A. So it's understood that when you're 14 thinking about postnatal lead and arsenic in 15 relation to autism and ADHD -- I'm sorry; that's 16 so distracting, whatever that voice is -- that 17 that's not their only time period of exposure. 18 The fact that babies and children are 19 exposed during other periods of time doesn't 20 negate the etiological role of postnatal exposure. 21 For example, like in my studies of PFAS, 22 we're measuring PFAS in people in middle age and 23 older age, knowing that they were exposed when 24 they were much younger as well. That doesn't mean 25 that there isn't an etiological role for</p>	<p style="text-align: center;">Page 224</p> <p>1 later-life PFAS exposure. 2 So I took this into consideration more 3 because I was interested in how that can inform 4 questions about temporality. 5 Q. But recognizing, as you have, that there 6 can be and is prenatal exposure to lead and 7 arsenic and some studies have related that to the 8 outcome of ASD and ADHD, to what extent did you 9 factor that into your consideration of the 10 postnatal studies you relied on? 11 MR. ESFANDIARY: Asked and answered three 12 times. 13 You can answer it again. 14 A. Like I said, it was relevant to me to 15 inform temporality -- they're not perfectly 16 correlated. So you could -- everyone may be 17 exposed in a study to lead. They may have body 18 burden of lead. 19 But it's still going to be variable. 20 There's variability for prenatal exposures and 21 there's variability for postnatal exposures to 22 both lead and to arsenic. 23 So a finding of an association for 24 prenatal lead and arsenic doesn't mean that there 25 can't be an impact of postnatal lead and arsenic</p>

<p style="text-align: center;">Page 225</p> <p>1 on ASD and ADHD, nor does it mean that there 2 definitely is. It's simply important to consider. 3 As an epidemiologist, I considered the entire 4 literature on these metals.</p> <p>5 Q. I understand you considered the whole 6 literature. I'd like to understand how you 7 factored in the prenatal exposures to lead and 8 arsenic to the postnatal studies you relied on.</p> <p>9 What methodology did you use to exclude 10 the prenatal effects that you know occur from the 11 postnatal studies you relied on? Did you use any 12 methodology to do that?</p> <p>13 A. You don't want to exclude that. Like, if 14 we were excluding a role of prenatal exposure, 15 that would be weird. If anything, that would just 16 be weird to exclude it.</p> <p>17 It's like I feel like you keep asking me 18 about the need to exclude other exposures in my 19 assessment of causality. That is not how it 20 works. It's not required.</p> <p>21 Just like if you were assessing the role 22 of cigarette smoking in later adulthood, you 23 wouldn't want to exclude -- you don't need to 24 exclude the role of cigarette smoking early on in 25 life.</p>	<p style="text-align: center;">Page 226</p> <p>1 Or maybe sun exposure is probably a better 2 example. We know that sun exposure during 3 childhood is the most etiologically relevant in 4 terms of sunburns. That doesn't exclude the role 5 of adulthood sun exposure, and you wouldn't want 6 to exclude that.</p> <p>7 Q. How methodologically did you exclude from 8 the postnatal heavy metal ASD/ADHD studies you 9 rely on that the effect may have already occurred 10 prenatally? How did you exclude that possibility?</p> <p>11 A. The exposure did start. So I think what 12 you're saying is these exposures are cumulative. 13 And so I think you are acknowledging what I have 14 talked about here, that these are cumulative 15 exposures.</p> <p>16 And the fact that children are typically 17 already born exposed to heavy metals only 18 underscores the importance of reducing their 19 presence, you know, and the fact that, you know, 20 the amount of heavy metals in baby food is 21 outrageous.</p> <p>22 It's getting better. You guys are 23 decreasing it. But it only underscores the need 24 to reduce those exposures because they're not the 25 only exposures. They actually -- they contribute</p>
<p style="text-align: center;">Page 227</p> <p>1 to body burden. And like I said, for some kids 2 they can be the primary contributors.</p> <p>3 For most kids age 1 to 6, food is the 4 primary contributor. For a lot of kids, their 5 exposure to heavy metals from other sources can 6 actually -- can be even bigger.</p> <p>7 Q. So I'm just simply asking what methodology 8 did you use to exclude the fact that the total 9 effect resulting in the outcome of ASD or ADHD 10 postnatally may have already occurred prenatally?</p> <p>11 MR. ESFANDIARY: Objection, vague and 12 ambiguous.</p> <p>13 A. You wouldn't exclude that 14 methodologically. That would not be appropriate. 15 It's so relevant here. I mean --</p> <p>16 Q. So the effect may have occurred totally 17 prenatally before you ever get to the postnatal 18 point. Correct?</p> <p>19 A. In a great world where you guys remove the 20 lead and arsenic from your products or your 21 clients' products, then -- and from other sources 22 so that the only exposure is prenatally, then yes, 23 the entire exposure could theoretically in the 24 future all be prenatal. That's not how it is.</p> <p>25 Children are born exposed, but then they</p>	<p style="text-align: center;">Page 228</p> <p>1 continue to be exposed to varying degrees. 2 They're exposed to varying degrees before they're 3 born and then afterwards.</p> <p>4 Q. How did you evaluate or weigh the relative 5 contributions of prenatal exposure to lead and 6 arsenic in the studies versus postnatal effects?</p> <p>7 A. You don't need to. That's the point, that 8 it's the body burden. And it actually doesn't 9 matter, you know, what it's coming from.</p> <p>10 So, for example, it doesn't matter if it's 11 coming from their mothers or from the food that 12 they eat or the dust in their house.</p> <p>13 What my charge was was to look at their 14 body burden. And some may have been, you know, 15 stored from birth. So that's what the studies 16 really looked at.</p> <p>17 They didn't look at where -- what the 18 exposure was. Were they born with a certain 19 amount of exposure? Did it come from the dust in 20 their house, the soil in their yard?</p> <p>21 Q. So the answer to my question is, you 22 applied no specific evaluation or weighting of the 23 source of exposure in the postnatal studies of ASD 24 and ADHD in lead or arsenic that you relied on. 25 Correct?</p>

<p style="text-align: right;">Page 229</p> <p>1 MR. ESFANDIARY: Objection, misstates the 2 testimony. 3 A. That sentence just doesn't make sense. 4 I'm sorry. 5 Q. All right. You've acknowledged there 6 could be exposure to these heavy metals, lead and 7 arsenic, from many different sources. Correct? 8 A. That is correct. Yeah. For not all 9 children. So different children will be exposed 10 from different sources. 11 The majority of young children will be 12 exposed from their food, but not all children. 13 Some children, the amount they're exposed to from 14 their food will pale in comparison to the amount 15 that they were exposed to from other sources. It 16 will vary. 17 And then the amount that they are exposed 18 to. So the amount they're exposed to prenatally, 19 the amount they're exposed to before they start 20 eating baby food, the amount that they're exposed 21 to while they're eating baby food, all those 22 different time periods. You wouldn't want to 23 exclude them. 24 When you say methodologically, that sort 25 of implies that I have conducted original research</p>	<p style="text-align: right;">Page 230</p> <p>1 on this. And as you can see, there was no 2 Gardener, et al., in terms of the study -- this 3 hypothetical study that you're trying to ask about 4 my methodology for doesn't exist. 5 Q. I'm simply asking, did you as part of your 6 methodology in arriving at your conclusions assign 7 any weight to prenatal exposure, postnatal 8 exposure, before consuming baby food, during 9 consumption of baby food, after consumption of 10 baby food? Did you assign any sort of weighting 11 or evaluation of those various sources? And if 12 you didn't do it, that's fine. I'm just curious 13 methodologically whether you did that. 14 A. Absolutely. So this matter relates to 15 postnatal exposure. So coming to my conclusions, 16 I really weighted the data from postnatal 17 exposure. 18 I considered that prenatal exposure too. 19 But in forming my opinions, what's most relevant 20 for this matter is postnatal exposure. So that 21 was -- 22 Q. But how did you consider or weigh the 23 prenatal exposure? I don't understand how you did 24 that other than just saying you considered it. 25 MR. ESFANDIARY: Objection.</p>
<p style="text-align: right;">Page 231</p> <p>1 Q. You had to use some methodology or process 2 to factor in the prenatal exposures in relying on 3 the postnatal studies. Right? 4 MR. ESFANDIARY: Objection, vague and 5 ambiguous. The question doesn't make any sense. 6 A. The question doesn't make sense from an 7 epi perspective. I don't know if there are 8 specific methodologies that you're asking. 9 Q. Just whether you had one, that's all I'm 10 asking, to weight the different sources of 11 exposure in different time periods of exposure. 12 A. I'm sorry. The question just doesn't make 13 sense. 14 Q. So you didn't apply any such 15 methodology -- 16 MR. ESFANDIARY: No. 17 A. The question doesn't -- 18 MR. ESFANDIARY: That misstates the 19 testimony. 20 Q. How did you weight prenatal exposure with 21 respect to the postnatal studies you relied on? 22 A. Yeah. So the way that I weighted this 23 into my opinion is I also read the literature on 24 the prenatal exposure. And I used it to help 25 really allay my concerns about potential --</p>	<p style="text-align: right;">Page 232</p> <p>1 concerns about potential temporality in the 2 literature on the postnatal exposure. 3 Q. The kids in the postnatal exposure studies 4 all would have been exposed prenatally. Correct? 5 MR. ESFANDIARY: Objection, calls for 6 speculation, overbroad. 7 A. So when you say -- it all varies. People 8 are exposed to varying amounts postnatally and 9 prenatally. 10 Q. I understand. And did you do any sort of 11 evaluation or weighting in the studies you 12 considered to apportion a certain amount to 13 prenatal lead and arsenic exposure, a certain 14 amount to postnatal lead or arsenic exposure? 15 A. I'm sorry, but your question just makes no 16 sense from an epi -- it's just not a question any 17 epidemiologist or biostatistician would -- it 18 doesn't make sense to my profession, so I don't 19 know how to answer it and I don't know how to 20 describe to you why or how it makes no sense. 21 Q. Did you consider at all quantitatively the 22 prenatal contribution of exposure to lead and 23 arsenic in the postnatal studies you relied on? 24 A. I feel like you're trying to ask it in 25 different ways. It just doesn't make sense. I</p>

<p style="text-align: right;">Page 233</p> <p>1 feel like I have answered this question over and 2 over again.</p> <p>3 I think what -- you're asking a question 4 that could be a valid question about an individual 5 study that I authored.</p> <p>6 Q. No. I'm asking your --</p> <p>7 A. I just don't understand your question.</p> <p>8 Q. I'm sorry. I talked over you.</p> <p>9 I'm asking you when you evaluated the 10 postnatal heavy metal exposure studies that you 11 rely on and have described in your report, I'm 12 just wondering how you considered or evaluated, 13 let's say, contribution of genetics to the 14 outcome.</p> <p>15 How did you evaluate contribution of 16 genetics versus what you believe is contribution 17 of the heavy metals?</p> <p>18 A. Yeah. So I can talk about that. Do you 19 want me to talk about --</p> <p>20 Q. I just --</p> <p>21 A. -- how I thought about genetics?</p> <p>22 Q. I was just wondering --</p> <p>23 MR. ESFANDIARY: Whoa, whoa, whoa. She 24 was in the middle of answering your question. 25 You asked about genetics. Do you want to</p>	<p style="text-align: right;">Page 234</p> <p>1 withdraw that question and ask a new one? 2 MR. KLATT: I'll withdraw the question.</p> <p>3 Q. Did you consider the contribution of 4 genetics to the outcome of the postnatal heavy 5 metal studies that you relied on for your opinions 6 in the case?</p> <p>7 A. Yeah. I talked a lot about genetics here. 8 Genetics are relevant. And I talked about how 9 there is data to suggest that the interaction 10 between the genetics -- genetic factors and lead 11 and arsenic, that there is -- so when we talk 12 about some kids are more vulnerable, there are 13 some kids for whom baby food is going -- heavy 14 metals from baby food is going to be more 15 etiologically relevant than other kids and how I, 16 as an epidemiologist, look at it from a population 17 perspective.</p> <p>18 But from an individual perspective, you 19 have to think about the circumstances of that 20 child.</p> <p>21 And part of that is genetics, and there 22 are genetic risk factors for autism. We know that 23 there's a role for lead and arsenic in causing 24 autism and ADHD. And that likely interacts with 25 genes and their control of the metabolism,</p>
<p style="text-align: right;">Page 235</p> <p>1 absorption, detoxification of lead and arsenic 2 such that an amount of heavy metals would be more 3 etiologically relevant, more likely to cause ASD 4 and ADHD in those children than in other children. 5 And I talked about that in this report.</p> <p>6 Q. Did you come to any conclusions on the 7 extent to which in the heavy metal studies you 8 rely on genetics contributes to the outcome of ASD 9 or ADHD compared to the percentage contribution of 10 what you believe is heavy metal exposure?</p> <p>11 A. So I thought you were going somewhere 12 different.</p> <p>13 So how much these genes, these autism 14 genes are impacting the causality of lead and 15 arsenic. It's presumed to be substantial. That's 16 beyond the -- I was not charged with identifying 17 that.</p> <p>18 Q. So you didn't --</p> <p>19 A. So the amount, that would be irrespective 20 of your genes and the amount that wouldn't -- that 21 probably partly depends on how exposed you are.</p> <p>22 So there are some genes that make it so 23 that your exposures to certain toxins are more 24 relevant.</p> <p>25 And this is a good analogy in terms of,</p>	<p style="text-align: right;">Page 236</p> <p>1 like, smoking and lung cancer. Part of the reason 2 why some people will smoke all day every day and 3 never get lung cancer is because their genetics 4 are different from the person who just smokes a 5 tiny amount and gets lung cancer.</p> <p>6 There's a difference in their genes that 7 regulate how the toxins in cigarettes are 8 metabolized and absorbed and how they impact the 9 etiology of that disease.</p> <p>10 That's the exact same thing that's 11 hypothesized here. We know that lead and arsenic 12 cause autism and ADHD, as I laid this out here.</p> <p>13 How the specific genes that are involved, 14 how that relates, which ones are -- which ones are 15 controlling those pathways, that has not been 16 worked out. It's been talked about. But we don't 17 have specific answers for that.</p> <p>18 Q. When evaluating the postnatal heavy metal 19 exposure studies that you rely on in coming to 20 your opinions in the case, how did you consider 21 the extent to which other environmental exposures 22 other than lead and arsenic may have contributed 23 to the outcome of ASD or ADHD?</p> <p>24 A. That wasn't part of my charge. So that's 25 a specific causation. That is for the other</p>

<p style="text-align: center;">Page 237</p> <p>1 experts who need to think about, all right, you 2 have a specific child. And what are their 3 different exposures?</p> <p>4 For example, an epidemiologist can say, 5 you know, all right, smoking is a strong risk 6 factor for lung cancer. Radon is a strong risk 7 factor for lung cancer. We don't need to know the 8 amount of radon to -- actually in our equations 9 for identifying the etiological fraction of 10 smoking. We actually don't even take into account 11 radon.</p> <p>12 That's different from someone who would be 13 charged with specific people and deciding their -- 14 the impact of smoking versus radon for those 15 individuals.</p> <p>16 So when we look at the etiological 17 fraction, the attributable risk in an epi study, 18 we don't necessarily need to -- we don't bring in 19 the other risk factors. When you add them all up, 20 there can be over 100 percent. But that's very 21 different from the science of identifying the 22 etiological role for individuals.</p> <p>23 Q. So it wasn't part of your charge to 24 consider the extent to which other environmental 25 exposures other than lead and arsenic may have</p>	<p style="text-align: center;">Page 238</p> <p>1 contributed to the outcome of ASD and ADHD in the 2 studies you rely on. Correct?</p> <p>3 MR. ESFANDIARY: Objection, misstates the 4 testimony.</p> <p>5 MR. KLATT: She said that wasn't part of 6 my charge.</p> <p>7 Q. Is that correct?</p> <p>8 A. Can you show me where I said -- how about 9 this? I'll read you my charge. Anything that's 10 not in what I read is not part of my charge.</p> <p>11 Q. That's not my question.</p> <p>12 I said, how did you consider the extent to 13 which other environmental exposures other than 14 lead and arsenic may have contributed to the 15 outcome of ASD and ADHD in the studies you relied 16 on?</p> <p>17 And your answer was, that wasn't part of 18 my charge, my specific causation.</p> <p>19 MR. ESFANDIARY: No, You're misstating the 20 testimony. You're omitting literally paragraphs 21 of her answer.</p> <p>22 MR. KLATT: Nonresponsive paragraphs.</p> <p>23 MR. ESFANDIARY: Read her entire response.</p> <p>24 MR. KLATT: No, I'm not going to waste 25 time doing that. You can ask her that.</p>
<p style="text-align: center;">Page 239</p> <p>1 MR. ESFANDIARY: No, I don't need to. 2 Q. Is it part of your charge or not to 3 consider the extent to which other environmental 4 exposures other than lead and arsenic may have 5 contributed to the outcome of ASD and ADHD in the 6 studies that you rely on in this case? 7 A. So that question just doesn't make sense 8 from an epi perspective. It literally makes no 9 sense. 10 Q. Was it part of your charge? 11 A. My charge made a lot of sense, and I'm 12 happy to read it. Things that make absolutely no 13 sense scientifically were not part of my charge. 14 If a lawyer gave me a charge that made no 15 sense, I would say, Pedram, that makes no sense. 16 I'm not talking about that under oath because that 17 makes no sense. 18 Q. When evaluating the postnatal heavy metal 19 exposure studies that you rely on in coming to 20 your opinions in this case, how did you consider 21 the extent to which other environmental exposures 22 other than lead and arsenic may have contributed 23 to the outcome of ASD or ADHD? 24 A. The question doesn't make sense. I don't 25 know how to explain to you the fact that that</p>	<p style="text-align: center;">Page 240</p> <p>1 sentence -- that question makes no sense. So I 2 don't know how to answer it. 3 Q. Did you do it or not? 4 A. I didn't do anything that makes no sense. 5 I would not. If you called me and tried to -- 6 MR. ESFANDIARY: Wait for a question. 7 Q. Did you consider the extent to which other 8 environmental exposures in the studies you rely on 9 for ASD and ADHD may have contributed to the 10 outcome in the studies? Did you consider it or 11 not? 12 MR. ESFANDIARY: Asked and answered. 13 A. The question -- what is the outcome in the 14 study? 15 Q. ASD or ADHD. 16 A. That's not -- like, it just makes no 17 sense. Like, the question just doesn't make 18 sense. 19 If you came to me and gave me that as a 20 charge, I would say to you that charge doesn't 21 make sense. 22 MR. ESFANDIARY: Mike, maybe I can help 23 out. Are you asking about confounding? Is that 24 what you're trying to get at in the studies? 25 MR. KLATT: I'm just asking whether she</p>

<p style="text-align: right;">Page 241</p> <p>1 considered --</p> <p>2 MR. ESFANDIARY: I know, I know. But</p> <p>3 clearly it's not working. So are you asking</p> <p>4 whether some of the results were confounded by</p> <p>5 other exposures? Maybe you should ask it that</p> <p>6 way.</p> <p>7 MR. KLATT: All right. Let's ask Pedram's</p> <p>8 question.</p> <p>9 Q. Were the results of the postnatal ADHD and</p> <p>10 ASD studies regarding lead and arsenic confounded</p> <p>11 by other environmental exposures?</p> <p>12 A. So I did think about what confounders were</p> <p>13 controlled for, and I thought about, you know,</p> <p>14 what are possible confounders.</p> <p>15 I think sort of this line of questioning</p> <p>16 came on the heels of thinking about, like, PFAS</p> <p>17 and brominated flame retardants. Those are not</p> <p>18 considered major confounders.</p> <p>19 I haven't seen those controlled for in the</p> <p>20 study. I haven't seen -- in talking to people, in</p> <p>21 reviewing other grants on these heavy metals, I've</p> <p>22 never heard of people saying, "Oh, but they didn't</p> <p>23 adjust for brominated flame retardants or PFAS."</p> <p>24 Q. Or phthalates?</p> <p>25 A. Yes, or phthalates. I've never -- in all</p>	<p style="text-align: right;">Page 242</p> <p>1 the -- I shouldn't say that.</p> <p>2 In other things that I've been asked to</p> <p>3 review, that does not come up as an important</p> <p>4 source of bias.</p> <p>5 Q. Let me ask you --</p> <p>6 A. And we have literature on --</p> <p>7 Q. There's no question pending.</p> <p>8 MR. ESFANDIARY: She was finishing</p> <p>9 answering your initial question.</p> <p>10 A. Am I allowed to take a minute to pause</p> <p>11 and, like, think about another --</p> <p>12 MR. ESFANDIARY: Of course you are.</p> <p>13 A. So when you think about -- right now</p> <p>14 there's all these exposures to PFAS, to</p> <p>15 phthalates, to brominated flame retardants.</p> <p>16 We knew -- we have strong data that lead</p> <p>17 and arsenic were important neurotoxins during</p> <p>18 times when those exposures were not nearly as</p> <p>19 prevalent as they are now.</p> <p>20 So I am confident that my opinions on --</p> <p>21 that lead and arsenic cause autism and ADHD are</p> <p>22 not only in the absence of other environmental</p> <p>23 toxins.</p> <p>24 MR. KLATT: Object to the</p> <p>25 nonresponsiveness of the answer and move to strike</p>
<p style="text-align: right;">Page 243</p> <p>1 everything that begins with "when you think</p> <p>2 about."</p> <p>3 Q. Can we go back to I believe it's</p> <p>4 Exhibit 3, which is the supplemental report.</p> <p>5 A. Exhibit 3. This rebuttal?</p> <p>6 Q. I called it supplemental. You're correct,</p> <p>7 Exhibit 3 is your rebuttal report of July 15th,</p> <p>8 2025 in this case. Correct? Is that correct?</p> <p>9 A. That it's Exhibit 3, yes.</p> <p>10 Q. And in there, you talked about the levels</p> <p>11 of heavy metals that were calculated by Dr. Jones.</p> <p>12 And if you need to, take a second to look at that.</p> <p>13 A. Yes.</p> <p>14 Q. Do you understand how Dr. Jones calculated</p> <p>15 her blood lead levels?</p> <p>16 A. No, I do not have -- I am not well versed</p> <p>17 in how she did that.</p> <p>18 Q. What is your understanding of what</p> <p>19 Dr. Jones was trying to calculate there? What</p> <p>20 were those blood lead levels representative of?</p> <p>21 A. Can you show me?</p> <p>22 Q. Let's look. You said -- in Exhibit 3 you</p> <p>23 said, "In my report I discuss how the levels</p> <p>24 calculated by Dr. Jones represented meaningful</p> <p>25 exposures of lead or arsenic by comparing the</p>	<p style="text-align: right;">Page 244</p> <p>1 levels to various benchmarks and finding those</p> <p>2 benchmarks were exceeded. I've now been advised</p> <p>3 that Dr. Jones has revised her estimates of the</p> <p>4 average daily dose of lead and arsenic in</p> <p>5 defendants' baby food and the blood levels</p> <p>6 associated with those doses."</p> <p>7 Do you see that?</p> <p>8 A. I sort of lost you, but okay.</p> <p>9 Q. Go ahead and read if you need to, to catch</p> <p>10 up. I was just reading from the rebuttal report.</p> <p>11 A. Okay.</p> <p>12 Q. So I'm just trying to understand what</p> <p>13 these daily doses in blood levels represent. Is</p> <p>14 that what a typical child might consume? What is</p> <p>15 your understanding of what those values represent?</p> <p>16 A. They represented hypothetical menus. I'm</p> <p>17 just thinking. Like -- how to describe this?</p> <p>18 Like a possible distribution across a day of</p> <p>19 various baby foods.</p> <p>20 Q. The menus that Dr. Jones made calculations</p> <p>21 for, these hypothetical menus, did you do any</p> <p>22 evaluation to consider whether they were realistic</p> <p>23 menus that actually might be consumed by a child</p> <p>24 or not?</p> <p>25 A. No, I didn't. But I also don't really</p>

<p style="text-align: right;">Page 245</p> <p>1 have the expertise. I don't have the expertise to 2 come up with menus for a hypothetical child. I've 3 only fed two children, my own children, in my 4 whole life. I have never created or analyzed 5 other people's hypothetical menus, so I don't have 6 the expertise to say how realistic, how 7 representative they might be.</p> <p>8 Q. Okay.</p> <p>9 A. How many kids have eaten, will eat, would 10 eat those precise menus.</p> <p>11 Q. Are you offering an opinion, Dr. Gardener, 12 on the minimum dose and duration of exposure to 13 lead that's necessary to cause ASD or ADHD from 14 any source?</p> <p>15 MR. ESFANDIARY: Objection, previously 16 asked and answered.</p> <p>17 A. So what I've written in my report many 18 times is that there is no safe level of lead. And 19 there are many health organizations that have 20 repeatedly stated that there is no safe level of lead.</p> <p>22 And in the literature, there is no level 23 of lead exposure below which we can say, you know, 24 autism or ADHD would not be causally related. 25 What we do see in the literature is that</p>	<p style="text-align: right;">Page 246</p> <p>1 in populations with really, really low levels of 2 exposure, there's still variability. And within 3 that variability, we're seeing associations with 4 lead and ADHD.</p> <p>5 And so I -- there was no minimum amount of 6 exposure. There was also a suggestion that within 7 those levels increased exposure was associated 8 with an increased risk.</p> <p>9 So I am not here with an estimate for an 10 amount of exposure that is safe, nor am I here 11 saying that there's an amount of an exposure that 12 would always cause autism or ADHD.</p> <p>13 Really on a population-wide level, 14 increased exposure is associated with an increased 15 risk.</p> <p>16 But on an individual level, it would 17 depend on the circumstances of that child, that 18 child's genetics, that child's -- the amount that 19 they are exposed, and their ability to detoxify 20 and metabolize that lead and their exposure from 21 other sources, their other environmental exposures.</p> <p>23 Q. So you're not offering an opinion in this 24 case on the minimum amount of lead that's necessary to cause ADHD or ASD. Correct?</p>
<p style="text-align: right;">Page 247</p> <p>1 A. Right. I don't have . . . 2 (Interruption) 3 A. There is no amount that is minimally -- 4 there is no minimum amount of exposure or -- below 5 which autism -- lead and arsenic don't cause 6 autism and ADHD, nor is there a maximum amount. I 7 mean, there's an amount a child might die, but 8 they might die not autistic, without ADHD. 9 Q. Are you offering any opinion in this case 10 that homemade baby food is safer than commercially 11 bought baby food? 12 A. That was not part of my charge, and that 13 was not -- all of my opinions are laid out. 14 Q. As a scientist in this area who's reviewed 15 literature, you're not intending to offer any 16 opinion that homemade baby food or table food is 17 safer than commercially bought baby food. 18 Correct? 19 A. Safer? Safer is very broad. So I'm not 20 representing anything about anything being safer 21 or less safe. I am not rendering any opinions 22 about the exposure sources. 23 Like I said, what matters is the body 24 burden. And the amount of lead exposure from a 25 jarred, you know -- a jarred Plum apple sauce,</p>	<p style="text-align: right;">Page 248</p> <p>1 versus an apple sauce -- shout it out. 2 I don't even know if Plum makes a jarred 3 apple sauce versus a batch of apple sauce that I 4 may have made myself. I'm not saying that either 5 of those sources are better or worse. They both 6 can contribute to the overall body burden. 7 Q. And so you believe that fruits, 8 vegetables, or grains purchased off the shelf, not 9 as part of a commercially prepared product, are 10 sufficient to cause ASD or ADHD if they contain 11 lead or arsenic? 12 MR. ESFANDIARY: Objection, overbroad, 13 calls for speculation, and undisclosed opinion. 14 A. And so many components to that. If I said 15 yes or if I said no, it would be like what part of 16 this could be no. 17 Q. I'm just -- would you like me to rephrase 18 it or can you answer? 19 MR. ESFANDIARY: If she'd like you to 20 rephrase it, she'll tell you. But she was 21 answering the question. 22 Go ahead, Doctor. 23 A. There was so many compounds in there. 24 Q. Let's read it again. 25 Do you believe that fruits, vegetables, or</p>

<p style="text-align: center;">Page 249</p> <p>1 grains purchased off the shelf at a grocery store 2 in the U.S. that aren't part of commercially 3 prepared baby food are sufficient to cause ASD or 4 ADHD if they contain lead or arsenic?</p> <p>5 MR. ESFANDIARY: That's literally the same 6 question, so I'm going to state the same 7 objections: overbroad, calls for speculation, 8 undisclosed opinion.</p> <p>9 A. So the "sufficiency" word -- there really 10 is a specific causation because there's no -- 11 there's no amount that, you know, on a 12 population-wide level every single person who gets 13 this grain and this is going to be autistic or 14 have ADHD.</p> <p>15 What I'm saying is what you named, grains, 16 fruits, and vegetables that are not part of 17 commercial baby food, that you go to Shaw's and 18 you get some food and you mix it up and you give 19 it to your baby, that can and may have both lead 20 and arsenic.</p> <p>21 And that lead and arsenic will contribute 22 to the body burden of the children, the babies, 23 the adults that consume that product -- those 24 products and can contribute as a result to the 25 neurodevelopmental harm on a population-wide</p>	<p style="text-align: center;">Page 250</p> <p>1 level. 2 For a specific individual, whether that 3 specific child will end up with autism or ADHD, 4 that's a totally different factor.</p> <p>5 But if you're asking are there relevant 6 sources of lead and arsenic on a grocery shelf 7 beyond what's in the baby food aisle, yes.</p> <p>8 Lead and arsenic are not just problems of 9 the baby food industry. The baby food industry 10 seems to be making great strides in terms of 11 reducing those exposures. My hope is that that 12 will -- that will be translated to food more 13 generally.</p> <p>14 Q. Do you believe that the produce in the 15 produce section that's not in a jar or pouch but 16 just available, the fruits and vegetables on the 17 produce shelf at grocery stores, contain lead or 18 arsenic?</p> <p>19 MR. ESFANDIARY: Objection, overbroad, 20 vague and ambiguous, calls for speaks.</p> <p>21 A. Some will and some won't. I mean, it 22 depends on the produce, where it's grown, what 23 water, what soil.</p> <p>24 Lead and arsenic are not specific to baby 25 food. There's plenty of fruits and vegetables.</p>
<p style="text-align: center;">Page 251</p> <p>1 In some circumstances, there can be contamination 2 related to the processing, but a lot of the 3 exposure is understood to be from the soil from 4 which it's grown, the water from which it's grown. 5 So that would relate not just to food in 6 the baby aisle but outside the baby aisle, 7 absolutely, as well. And when those items have 8 lead and arsenic, they're also etiologically 9 relevant because the source doesn't matter. 10 My charge here related more to the lead 11 and the arsenic exposure in terms of their ability 12 to cause autism and ADHD. And that's not specific 13 to baby food. It relates to homemade food, food 14 anywhere in the grocery. 15 And it's not just related to food. It's 16 related to the home environment in general, the 17 school environment. So many different exposures. 18 And it's not exclusive of -- it doesn't exclude 19 the role of food as well. 20 Q. You rely on a number of foreign studies in 21 your materials considered list and in your report. 22 Do you have any understanding whether on 23 average on the population level children's 24 exposures to heavy metals in non-Western 25 developing countries are often much higher than</p>	<p style="text-align: center;">Page 252</p> <p>1 those in the United States? 2 A. They can be. It depends on the time 3 period. It depends on the population. The levels 4 of heavy metals vary within the United States, 5 over time, by country, by county. 6 Q. For example, in the -- in your materials 7 considered list, Exhibit 3, I think on page 26 you 8 refer to several studies by a lead author of 9 Rahbar or Rahbar, done in Jamaica. 10 A. I'm sorry. Which exhibit are we looking 11 at? 12 Q. Exhibit 3, your materials considered list. 13 A. Yup. 14 Q. I believe it's at page 26. 15 A. Yup. There were a few studies. So what I 16 see here is that in the past -- in the past, my 17 reports have also included mercury. And so, like, 18 I just noticed this. Some of these articles in 19 this list may not actually have informed my 20 opinion on the current version of my report. The 21 version of my report relates to lead and arsenic. 22 For example, I just saw Reference 23 Number 394 says, "Seafood consumption and blood 24 mercury concentrations in Jamaican children." 25 That's an example I just noticed of</p>

<p style="text-align: center;">Page 253</p> <p>1 something that probably doesn't actually --</p> <p>2 Q. Is that one of the Rahbar or Rahbar</p> <p>3 studies?</p> <p>4 A. Yes.</p> <p>5 Q. And there's a couple of other Rahbar</p> <p>6 studies you cite there. Correct?</p> <p>7 A. Yes.</p> <p>8 Q. Are any of them relating to lead?</p> <p>9 A. So if I'm just looking at the titles,</p> <p>10 there's one that says, "Blood lead concentrations</p> <p>11 in Jamaican children with and without autism</p> <p>12 spectrum."</p> <p>13 Q. Are you aware that the mean lead level of</p> <p>14 lead in Jamaican soil is two to three times higher</p> <p>15 than that in the United States?</p> <p>16 A. I am not prepared to opine on the relative</p> <p>17 levels of lead in soil in the United States versus</p> <p>18 Jamaica.</p> <p>19 Q. What about the studies from Egypt that you</p> <p>20 cite in your materials considered? Do you know</p> <p>21 any comparison between the average blood lead</p> <p>22 levels of Egyptian children compared to the</p> <p>23 average blood levels of United States children?</p> <p>24 A. So blood lead levels will change over time</p> <p>25 and by location within the United States, within</p>	<p style="text-align: center;">Page 254</p> <p>1 Massachusetts, within whatever state you live in,</p> <p>2 and by country, by time, and by different</p> <p>3 populations, by different race and ethnic groups,</p> <p>4 for example.</p> <p>5 And what matters is not necessarily where</p> <p>6 the blood -- where the lead is coming from but the</p> <p>7 overall contribution.</p> <p>8 And even when you look at, like -- say you</p> <p>9 were comparing New York versus Massachusetts and</p> <p>10 you saw, say, Massachusetts had higher blood lead</p> <p>11 levels than kids in New York, there would still be</p> <p>12 many kids in Massachusetts who would have much</p> <p>13 lower levels of lead and kids in New York who have</p> <p>14 much higher levels of lead. It's just that there</p> <p>15 might be a difference in the overall distribution.</p> <p>16 But at any location, you're going to have</p> <p>17 variability.</p> <p>18 Q. In citing Egyptian studies in your report,</p> <p>19 are you aware that the average Egyptian child has</p> <p>20 blood lead levels up to five to ten times higher</p> <p>21 than the average U.S. child?</p> <p>22 A. I can't confirm or deny that, off the top</p> <p>23 of my head. One of the great things about this</p> <p>24 literature and one of the strengths is that there</p> <p>25 was a confluence of data from many different</p>
<p style="text-align: center;">Page 255</p> <p>1 populations of kids.</p> <p>2 So for example, not all of the data came</p> <p>3 from the past five years where overall kids had</p> <p>4 lower lead levels than ten years ago.</p> <p>5 That doesn't mean that the data from ten</p> <p>6 years ago isn't relevant or the data from 15 years</p> <p>7 ago isn't relative. It just impacts the</p> <p>8 distribution.</p> <p>9 And one of -- the beauty of sort of</p> <p>10 looking at different time periods and kids from</p> <p>11 different socioeconomic status groups, kids from</p> <p>12 different parts of the United States and from</p> <p>13 different countries, is that when you see</p> <p>14 associations consistent in different study</p> <p>15 populations and over different time periods, that</p> <p>16 is actually reassuring even if the average</p> <p>17 level -- the average blood lead level in a child</p> <p>18 in 1995 in Egypt might be quite far off from a</p> <p>19 child in this study.</p> <p>20 That doesn't mean that that study is not</p> <p>21 informative at all.</p> <p>22 MR. KLATT: Okay. Object to the</p> <p>23 responsiveness of the answer after "I can't</p> <p>24 confirm or deny that, off the top of my head," and</p> <p>25 move to strike.</p>	<p style="text-align: center;">Page 256</p> <p>1 Q. Are you aware of any studies, whether you</p> <p>2 cited them in your report or not, that indicate</p> <p>3 that blood lead levels in developing countries are</p> <p>4 associated with ASD or ADHD but not blood lead</p> <p>5 levels in the United States?</p> <p>6 A. We saw -- in this literature base, there</p> <p>7 were associations in different countries. Like</p> <p>8 what I -- when you look at the ADHD literature, it</p> <p>9 is more consistent than any other literature that</p> <p>10 I've actually probably ever reviewed in my career.</p> <p>11 The amount of consistency in the lead and</p> <p>12 ADHD literature is probably actually just as</p> <p>13 consistent if not more than the literature I have</p> <p>14 seen in terms of smoking and stroke risk.</p> <p>15 Everyone knows smoking causes stroke. You ask any</p> <p>16 stroke neurologist, smoking causes stroke.</p> <p>17 Still, the literature on that association</p> <p>18 is less consistent than what we see in lead and</p> <p>19 ADHD here across so many different study</p> <p>20 populations.</p> <p>21 All the studies on lead and ADHD, they</p> <p>22 were not all conducted on white middle-class</p> <p>23 children in Chicago in the early aughts. They</p> <p>24 were studied in all different populations. And</p> <p>25 you see it again and again and again to the point</p>

<p style="text-align: right;">Page 257</p> <p>1 where as an epidemiologist the consistency was 2 truly remarkable.</p> <p>3 Q. Let me ask you the question again.</p> <p>4 Were you aware of any studies that you 5 reviewed that showed that the blood lead levels in 6 developing countries were associated with ASD and 7 ADHD but not the blood lead levels in the United 8 States? Were you aware of any such specific 9 studies? That's all I'm asking.</p> <p>10 A. That looked at children in some countries 11 and not in other countries --</p> <p>12 Q. That reviewed studies in developing 13 countries, reviewed studies in the United States, 14 found an association between blood lead levels in 15 developing countries and ASD and ADHD, but didn't 16 find that association in the United States.</p> <p>17 Are you aware of any specific studies that 18 showed that?</p> <p>19 A. So what you would be asking about is, 20 like, meta-analyses and review studies. So I'd 21 have to look back.</p> <p>22 What we do in meta-analyses --</p> <p>23 Q. I just need to know whether you recall any 24 such studies. I don't need to know --</p> <p>25 MR. ESFANDIARY: Please.</p>	<p style="text-align: right;">Page 258</p> <p>1 MR. KLATT: Come on, she's way beyond the 2 question.</p> <p>3 MR. ESFANDIARY: She's answering the 4 question. Stop interrupting the witness, please.</p> <p>5 MR. KLATT: I want responsive answers.</p> <p>6 MR. ESFANDIARY: She --</p> <p>7 Q. I simply asked you whether you were aware 8 of any studies, whether they want to be 9 meta-analysis or whatever, that show increased 10 risks in developing countries but not in the 11 United States?</p> <p>12 If you're aware of such studies, great. 13 If you're not, I don't need to know what you do 14 when you review meta-analyses.</p> <p>15 MR. ESFANDIARY: Objection.</p> <p>16 Q. Are you aware of any such studies?</p> <p>17 A. My answers are what they are no matter 18 what they are. They are my truth.</p> <p>19 And I'm doing my best to be as responsive 20 to your -- the way you're asking questions to the 21 best that I can be. I just want to be clear about 22 that.</p> <p>23 Whether they're found legally to be 24 unresponsive or not, I don't know. I'm doing my 25 best to interpret as an epidemiologist your legal</p>
<p style="text-align: right;">Page 259</p> <p>1 questions and answer them as an epidemiologist to 2 the best that I can.</p> <p>3 I can look through the reports so that I 4 don't misrepresent the literature.</p> <p>5 But sometimes in meta-analyses what we'll 6 do is we'll look at meta-regressions, were the 7 associations stronger in boys than in girls, in 8 older time period versus more recent time period.</p> <p>9 We often do that to try to get a sense of 10 was the association stronger when the association 11 levels were stronger.</p> <p>12 Q. Do you recall seeing any studies, 13 meta-analysis, whatever type, that showed 14 increased risk of ASD and ADHD in arsenic or lead 15 exposed children in developing countries but that 16 same study didn't show that increase in U.S. 17 studies? Are you aware of any such studies or 18 not, as we sit here?</p> <p>19 A. Are you saying I'm not allowed to look at 20 my report?</p> <p>21 Q. I'd just like to know, because you can 22 spend hours looking at your report, I'd just like 23 to know, off the top of your head, are you aware 24 of such studies? Have you seen or reviewed such 25 studies, to your recollection?</p>	<p style="text-align: right;">Page 260</p> <p>1 A. I feel like you're asking me to have 2 memorized this and give an answer without looking. 3 And I was told that I would be able to sort of 4 refer to it.</p> <p>5 So I don't feel comfortable guessing, 6 remembering things off the top of my head without 7 confirming.</p> <p>8 Q. I'm not asking you to guess. I'm asking 9 if you remember without having to refer to your 10 report.</p> <p>11 A. To be responsible as a scientist, I 12 would -- the most responsible thing would be to 13 refer to my report.</p> <p>14 Can we take a break for five minutes 15 before you put another --</p> <p>16 Q. Sure. Let me just ask, no study of that 17 nature comes to mind as you sit here without 18 looking at your report. Is that correct?</p> <p>19 A. I would have to look at my report because 20 there have been -- there have been 21 meta-regressions by country. But in order to 22 accurately as a scientist answer your questions -- 23 I don't think you want me to not be doing that.</p> <p>24 Q. I just want you -- I just want you to 25 respond to the question asked. That's all I'm</p>

<p style="text-align: right;">Page 261</p> <p>1 asking.</p> <p>2 A. And I want to be responsible here, which</p> <p>3 would require looking at my report. I'm happy to</p> <p>4 do that after the break if you still want me to.</p> <p>5 MR. KLATT: Let's take a break.</p> <p>6 THE VIDEOGRAPHER: This concludes Media</p> <p>7 Number 6. Going off the record, 4:13 p.m.</p> <p>8 (Recess, 4:13 p.m. to 4:30 P.M.)</p> <p>9 THE VIDEOGRAPHER: This is the beginning</p> <p>10 of Media Number 7. Going back on the record,</p> <p>11 4:30 p.m.</p> <p>12 BY MR. KLATT:</p> <p>13 Q. We're back on the record, Dr. Gardener.</p> <p>14 Are you doing okay?</p> <p>15 A. I am.</p> <p>16 Q. Can you name for me any medical or</p> <p>17 scientific organization that has concluded that</p> <p>18 consumption of baby food causes ASD or ADHD?</p> <p>19 A. I haven't -- as far as I know, no</p> <p>20 scientific organization has looked at it.</p> <p>21 What's relevant here is the lead and the</p> <p>22 arsenic. I haven't seen any organization -- any</p> <p>23 scientific organization confirm or deny any risk</p> <p>24 factor for autism or ADHD or, like, you know,</p> <p>25 dementia, for example.</p>	<p style="text-align: right;">Page 262</p> <p>1 Q. So you can't name any medical or</p> <p>2 scientific organization, as we sit here today,</p> <p>3 that has concluded that consumption of baby food</p> <p>4 causes ASD or ADHD. Correct?</p> <p>5 A. I haven't seen any medical organization go</p> <p>6 through the process of determining -- looking at</p> <p>7 that. So what their conclusion would be, I</p> <p>8 haven't even seen them, like, investigate that</p> <p>9 question or other risk factors for autism or ADHD</p> <p>10 or other -- or other outcomes.</p> <p>11 I haven't -- they could exist. They could</p> <p>12 exist for dementia.</p> <p>13 Q. My question specifically is, can you name</p> <p>14 one?</p> <p>15 A. I haven't looked.</p> <p>16 Q. Okay. Can you name any regulatory</p> <p>17 authority in any country, anywhere in the world,</p> <p>18 that's concluded that consumption of baby food</p> <p>19 causes ASD or ADHD?</p> <p>20 A. So I wasn't making the distinction between</p> <p>21 regulatory or medical authority. I haven't seen</p> <p>22 any that have looked into it, concluded it one way</p> <p>23 or another, for food or for any other risk factor.</p> <p>24 Q. Can you name any pediatric society that</p> <p>25 has concluded that consumption of baby food can</p>
<p style="text-align: right;">Page 263</p> <p>1 cause ASD or ADHD?</p> <p>2 A. I haven't seen any sort of review of baby</p> <p>3 food or food related to any outcome.</p> <p>4 Q. Can you name any psychiatric or neurologic</p> <p>5 organization -- and you're in the department of</p> <p>6 neurology -- who's concluded that consumption of</p> <p>7 baby food can cause ASD or ADHD?</p> <p>8 A. I am an associate professor in the</p> <p>9 department of neurology, and I've never seen any</p> <p>10 neurological association sort of write anything</p> <p>11 like that for food in relation to any neurological</p> <p>12 condition or any other environmental risk factor</p> <p>13 in relation to any neurological condition. I</p> <p>14 haven't seen any sort of similar kinds of reports</p> <p>15 in any way.</p> <p>16 Q. Including ASD or ADHD. Correct?</p> <p>17 A. Yeah. I haven't seen any reports on any,</p> <p>18 you know, risk factors of any kind in relation to</p> <p>19 ASD or ADHD, food in relation to any outcome,</p> <p>20 other environmental risk factors in terms of any</p> <p>21 outcomes.</p> <p>22 If you have an example of, like, a -- you</p> <p>23 know, something totally unrelated that would be</p> <p>24 similar --</p> <p>25 Q. My question is specific to ASD and ADHD.</p>	<p style="text-align: right;">Page 264</p> <p>1 And you can't name a neurologic or psychiatric</p> <p>2 society that has concluded that baby food</p> <p>3 consumption causes ASD or ADHD. Correct?</p> <p>4 A. I haven't seen anything -- I haven't</p> <p>5 looked, but I haven't seen any organization make</p> <p>6 any conclusions about any risk factors for those</p> <p>7 outcomes or other neurological outcomes.</p> <p>8 Q. And that would also include any</p> <p>9 nutritional society or organization. Correct?</p> <p>10 A. So I haven't seen any nutritional society</p> <p>11 comment on any sort of specific foods in relation</p> <p>12 to ASD, ADHD, any other neurological outcome or</p> <p>13 cardiovascular outcome.</p> <p>14 Q. Are you aware of any medical textbook that</p> <p>15 has concluded that consumption of baby food causes</p> <p>16 ASD or ADHD?</p> <p>17 A. I haven't read a medical textbook, you</p> <p>18 know, looking at anything like that.</p> <p>19 Q. There's no medical, scientific, or</p> <p>20 regulatory organization that has recommended that</p> <p>21 parents stop feeding their kids commercial baby</p> <p>22 food. Correct?</p> <p>23 A. I have seen organizations -- I'll find it</p> <p>24 here.</p> <p>25 So on page 110 of my report I wrote, "The</p>

<p style="text-align: center;">Page 265</p> <p>1 CDC and the FDA have both provided multiple 2 warnings about the potential for lead in baby food 3 to have grave health consequences for babies who 4 consume them.</p> <p>5 "In 2023, it was recognized that cinnamon 6 applesauce pouches alone were causing high blood 7 lead levels in babies, widespread across the U.S., 8 prompting recalls of multiple brands of cinnamon 9 applesauce and repeated warnings about lead 10 contamination in these baby food items by the FDA 11 and CDC.</p> <p>12 "In relation to lead contamination in 13 cinnamon applesauce pouches, the CDC warned 14 consumers to avoid eating any amount of the 15 recalled applesauce pouches, acknowledging that 16 there was no safe amount of these to consume of 17 these due to the lead contamination.</p> <p>18 "Public health agencies provided no 19 reassurance about how much of these pouches was 20 safe for babies to consume. Rather, they made it 21 clear that any consumption amount was a cause for 22 concern.</p> <p>23 "This situation provided clear recognition 24 that lead contamination in food marketed to babies 25 can cause lead toxicity and that there was no safe</p>	<p style="text-align: center;">Page 266</p> <p>1 amount to consume. 2 "In relation to the contamination of 3 applesauce pouches with lead, the FDA wrote: Lead 4 is toxic to humans and can affect people of any 5 age or health status, protecting children from 6 exposure to lead is particularly important because 7 they are more susceptible to lead toxicity. 8 "Most children have no obvious immediate 9 symptoms. Parents and caretakers should consult a 10 healthcare provider if you suspect a child may 11 have been exposed to lead. 12 "Short-term exposure to lead could result 13 in the following symptoms: headache, abdominal 14 pain, colic, vomiting, anemia. 15 "Longer-term exposure could result in the 16 following additional symptoms: irritability, 17 lethargy, fatigue, muscle aches, or muscle 18 prickly, burning, constipation, difficulty 19 concentrating, muscular weakness, tremor, and 20 weight loss. 21 "In relation to the consumption of 22 lead-contaminated applesauce pouches, the CDC 23 wrote the following: No safe level of lead in 24 children's blood has been identified. Lead 25 toxicity primarily targets the central nervous</p>
<p style="text-align: center;">Page 267</p> <p>1 system. Children are more vulnerable to lead 2 poisoning than adults because their nervous 3 systems are still developing. Children also tend 4 to absorb a higher fraction of ingested lead than 5 adults.</p> <p>6 "Although children with lead exposure may 7 have no apparent acute symptoms, even low levels 8 of lead have been associated with learning, 9 behavioral, and cognitive deficits. A child who 10 is exposed to large amounts of lead may develop 11 acute lead poisoning, presenting with 12 gastrointestinal, hematological, and neurological 13 effects, including one or more of the following 14 signs and symptoms."</p> <p>15 Q. That's far beyond the question I asked. 16 MR. ESFANDIARY: Hang on. 17 MR. KLATT: She's talking about symptoms 18 now and I asked about regulatory recommendations. 19 MR. ESFANDIARY: She was responding to 20 your question. 21 MR. KLATT: No. She's just reading ad 22 nauseam. We're far beyond the question. 23 Q. So can we go back -- 24 A. I thought that was -- do you want to 25 repeat the question again?</p>	<p style="text-align: center;">Page 268</p> <p>1 MR. ESFANDIARY: I want to be very clear. 2 Dr. Gardener was in the process of answering 3 Counsel's question. He interrupted her, 4 preventing her from answering the question. 5 But you can go ahead and ask your next 6 question. 7 MR. KLATT: Thank you. 8 Q. You're aware what you're reading from your 9 report relates to specific recalls of highly 10 contaminated individual products and doesn't apply 11 to baby food as a whole? Do you understand that? 12 A. So it was in relation to, in 2023, 13 lead-contaminated cinnamon applesauce pouches from 14 certain brands. 15 You asked me -- I thought I was being 16 responsive to your question. Do you want to 17 repeat your question? 18 Q. Yes. There's no medical, scientific, or 19 regulatory organization in the world that has 20 recommended that parents stop feeding children 21 commercial baby food. Correct? 22 A. Yes. So the CDC and FDA have issued very 23 clear warnings that parents of children stop 24 feeding their children these baby foods. In fact, 25 they told people to be cautious when cleaning up</p>

<p style="text-align: center;">Page 269</p> <p>1 these baby foods. Not just eating it but eating 2 any amount. Any amount, they said, can cause harm 3 and even cleaning it should be done with caution.</p> <p>4 Q. You recognize those CDC and FDA statements 5 in that particular year related to a particular 6 contaminated product -- in fact, not to the food 7 but to the cinnamon spice used in the food that 8 originated in South America and that was in 9 relation to a specific recall.</p> <p>10 My question isn't about a specific product 11 that's highly contaminated. I'm talking about 12 commercial baby foods that virtually every child 13 in the United States consumes on a regular basis.</p> <p>14 There's no medical, regulatory, or 15 scientific organization in the U.S. or anywhere in 16 the world that has told parents to stop eating 17 commercial baby food because of heavy metals. 18 True?</p> <p>19 A. No, that's not true. Even more so, first 20 of all, I want to correct something. You said it 21 wasn't due to the food. It was due to the 22 cinnamon in the food.</p> <p>23 Cinnamon is food. It's not like they were 24 talking about the cap of the food or the lining of 25 the pouch. They were talking about -- the</p>	<p style="text-align: center;">Page 270</p> <p>1 cinnamon is part of the food. It's an ingredient. 2 It's a listed ingredient. So I want to make that 3 point clear.</p> <p>4 Second of all, the FDA starting in January 5 of this year now has new regulatory guidelines 6 about not just the consumption but the sale of 7 specific baby foods. They have new regulations 8 about the amount of lead that can be sold in 9 different categories. I think it's 20 parts per 10 billion for, like, cereals and 20 parts per 11 billion for single-ingredient root vegetables and 12 10 parts per billion for everything else.</p> <p>13 So it should be understood that if those 14 products should not be sold they should also not 15 be consumed, I would say emphatically.</p> <p>16 Q. Has the FDA said to parents stop feeding 17 your children commercial baby food, period?</p> <p>18 A. The FDA in that guidance made it very 19 clear that children should not be eating baby 20 foods outside of those guidelines. And they made 21 it very clear that a pretty high proportion of 22 baby foods on the market in the past actually 23 wouldn't adhere to those guidelines.</p> <p>24 Q. Has FDA required those products to be 25 recalled?</p>
<p style="text-align: center;">Page 271</p> <p>1 MR. ESFANDIARY: Which products?</p> <p>2 Q. The products you just referred to that 3 don't meet those guidelines. Or are they still on 4 the shelves?</p> <p>5 MR. ESFANDIARY: Which manufacturer? 6 Which product?</p> <p>7 MR. KLATT: Any manufacturer.</p> <p>8 A. I will find the -- they had made it very 9 clear that those products should be considered 10 adulterated.</p> <p>11 Q. They have not said stop feeding your 12 children commercial baby foods because of heavy 13 metal consumption. Correct?</p> <p>14 A. They have said they should not be sold. 15 So it's very clear if they -- they're only being 16 sold to be eaten. So if they shouldn't be sold, 17 then they shouldn't be eaten.</p> <p>18 They are adulterated. The FDA has made it 19 very clear that not just are they regulating this, 20 but actually this is just their starting point. 21 That their goal of protecting children from lead 22 contamination in baby foods, this is just 23 starting. And these levels are harmful. And 24 these levels, products with these levels in the 25 past are widely on the shelves.</p>	<p style="text-align: center;">Page 272</p> <p>1 Q. They didn't conclude that those levels 2 caused any level of harm. That's just levels 3 below which they recommended that people make. 4 Correct?</p> <p>5 A. I'll read some excerpts of it.</p> <p>6 Q. That's fine. I withdraw the question.</p> <p>7 A. Okay.</p> <p>8 Q. Has the American Academy of Pediatrics 9 told American parents to stop feeding their 10 children commercial baby foods?</p> <p>11 A. I don't know.</p> <p>12 Q. You haven't seen that?</p> <p>13 A. I haven't seen their guidance about this. 14 No.</p> <p>15 Q. Do you agree with me, changing the 16 subject, that temporality is a component of 17 determining causality. Right?</p> <p>18 A. Temporality is part of the Bradford Hill 19 criteria that I wrote about extensively in my 20 report.</p> <p>21 Q. And exposure must precede outcome to meet 22 the temporality requirement. Correct?</p> <p>23 A. So in order for an exposure to cause an 24 outcome, it has to occur before the outcome. 25 But oftentimes in epi studies the exposure</p>

<p style="text-align: right;">Page 273</p> <p>1 is understood to occur before the outcome, but the 2 measurement of it can occur later. It can occur 3 concurrently. And we often do this. 4 As you so beautifully emphasized 5 throughout the day, you were talking about how 6 lead and arsenic exposure starts in utero and 7 continues for all of the in utero period and 8 infancy and childhood. And that is so important 9 here because it speaks to this whole temporality 10 issue. 11 You realize this lead and arsenic exposure 12 is not something that babies and children are only 13 exposed to later on when some of these studies 14 were conducted. 15 These are exposures that they've had their 16 whole life. If children were never exposed to 17 lead and arsenic until the age of 2, we wouldn't 18 be sitting here. I hold myself and my scientific 19 standards to a really, really high standard. And 20 if we were talking about an exposure that nobody 21 was exposed to until later on in life, I would not 22 have the confidence to be reporting this in the 23 way that I am. 24 Temporality is very important. The fact 25 that lead and arsenic exposure is a lifelong</p>	<p style="text-align: right;">Page 274</p> <p>1 exposure from the in utero period and throughout 2 infancy provided a lot of -- I should say it 3 really informed my opinion here. 4 MR. SACHSE: Motion to strike everything 5 after "So in order for an exposure to cause an 6 outcome, it has to occur before the outcome." 7 Thank you. 8 MR. KLATT: Can you mark this. 9 (Exhibit 10 marked for identification) 10 Q. I'm going to show you something I 11 prepared. And it's a question I'm going to ask 12 you. 13 Can you cite for me, Dr. Gardener, any 14 published epidemiologic study on lead or arsenic 15 exposure from any source, an ASD risk that meets 16 the following four criteria: 17 Number 1, exposure in the six months to 18 three-year-old time period. 19 Number 2, exposure to doses of lead and 20 arsenic one might reasonably get from baby food. 21 Number 3, an increase in the diagnosed 22 outcome of ASD. 23 And Number 4, in a population of U.S. 24 children? 25 MR. ESFANDIARY: Do you have an extra copy</p>
<p style="text-align: right;">Page 275</p> <p>1 of that? 2 MR. KLATT: Sure. 3 MR. ESFANDIARY: Thank you. 4 Q. As you sit here today, can you cite a 5 study that you've seen, that you've cited or not 6 cited, that meets those four criteria? And if so, 7 which one? 8 A. First of all, babies -- children in -- the 9 majority of the children in all of these studies 10 that I have cited were exposed to lead and arsenic 11 within the first three years of life. You talked 12 about that earlier, that maybe not every single 13 child in every single study, but we're talking 14 about lead and arsenic being ubiquitous. 15 In these studies, kids were all exposed 16 during this time period. Also, the exposure 17 levels in a lot of these studies were extremely 18 low. Extremely low. And similar to or even less 19 than the amount that was estimated in Dr. Jones 20 from the hypothetical menus and from the studies 21 that I conducted in terms of lead exposure in baby 22 food and what sort of understood from food in 23 general including baby food to have lead, not 24 every single study showed an association with 25 autism.</p>	<p style="text-align: right;">Page 276</p> <p>1 But as I showed in my report, many did. 2 And some of the studies were conducted in the 3 United States and some were not. 4 I would have to -- I don't think I have 5 time right now to go through and say which ones 6 were in the United States and which ones were not. 7 MS. FOUHEY: Move to strike as 8 nonresponsive. 9 MR. ESFANDIARY: She literally just 10 answered the question perfectly, point by point. 11 What are you talking about? Maybe I'm 12 losing it. 13 Ask your next question. 14 Q. You answered different studies for 15 different criteria. I'm asking for any published 16 epidemiologic study that met all four of these 17 criteria, exposure in the six month to 18 three-year-old time period -- 19 A. All of them. 20 Q. -- exposure to doses of lead and arsenic 21 one might reasonably get from baby food. 22 A. Almost all of them. 23 Q. An increase in the diagnosed outcome of 24 ASD, not just symptoms. 25 A. Not all of them but a good number.</p>

<p style="text-align: right;">Page 277</p> <p>1 Q. And I'm asking for a single study in a 2 population in the United States. 3 A. Not all, but a good number. I'd have to 4 look. 5 Q. Can you name one study that meets all four 6 of those criteria? 7 A. I'd have to look. Not off the top of my 8 head, but yeah. I mean, of course. As you talked 9 about earlier, these exposures are ubiquitous. 10 Q. We'll leave a blank in your deposition. 11 When you find that study that meets all four 12 criteria -- I'm not talking about five studies 13 that meet one, six studies that meet another. 14 A. Sure, yeah, tons. 15 Q. I'm talking about one study from the 16 United States that meets all four of those 17 criteria, if you would provide it as part of this 18 transcript. 19 MR. ESFANDIARY: No, she's not going to go 20 back and do additional homework. This is your 21 chance to ask questions. She's literally just 22 responded to your question. I know you don't like 23 it. 24 MR. KLATT: I'm not going to sit here for 25 three hours --</p>	<p style="text-align: right;">Page 278</p> <p>1 MR. ESFANDIARY: Calm down, wait for a 2 question. 3 She's not going to do any homework. This 4 is your time to ask questions, so wrap it up. 5 MR. KLATT: I'm not going to sit here and 6 let her go through a hundred-page report for three 7 hours. 8 MR. ESFANDIARY: Then don't ask a 9 ridiculous question. 10 MR. KLATT: No, that's a very simple 11 question. That's a foundational question. 12 MR. ESFANDIARY: It's a simple question? 13 You made an exhibit about it. 14 MR. KLATT: You're interrupting me now. 15 I'm asking if she can name, as she sits 16 here, a single study that meets those four 17 criteria. If she can't without referring to her 18 report, that's fine. I just want to know that. 19 A. I can't refer -- if you had asked me any 20 question -- I'm horrible with names. I don't 21 remember the names and the dates other than if it 22 was me, and like I said earlier, sometimes not 23 even if it was me. If you had asked me a set of 24 criteria and asked me about my own research, I 25 would have to look at those.</p>
<p style="text-align: right;">Page 279</p> <p>1 So I don't think it's reasonable for a 2 scientist to be able just to look at all those and 3 be like, you know, Joe Smith, 2018. 4 BY MR. KLATT: 5 Q. When you testify in front of Judge Corley 6 in December, if you do, are you going to sit there 7 and go through hundreds of pages of your report to 8 answer questions she may have? 9 MR. ESFANDIARY: Calls for speculation as 10 to what's going to happen six months from now. 11 A. All I can do in front of Judge Corley is 12 my best. I wouldn't make things up. Like, if 13 Judge Corley asked me this question, I wouldn't 14 just say, you know, Joe Smith, 2018. 15 I'm a human. I will be sworn in that day 16 and I will do everything to the best of my 17 ability, knowing that at the end of the day I need 18 to be professional as a scientist and I need to 19 do . . . 20 I would say to her, you know, if she was 21 asking the question, I need to look at the papers. 22 I need to -- if that isn't allowed, then I don't 23 know how to answer the question. 24 I would simply just have to answer 25 honestly. And that would be me being the most</p>	<p style="text-align: right;">Page 280</p> <p>1 responsive. I understand that's not the answer 2 you want. 3 Q. No. I just want an honest answer, what 4 you think you'll do if you're asked that same 5 identical question by Judge Corley. 6 A. So I've never been -- I guess I have been 7 in front of a judge. I had the Sargon hearing. 8 So maybe it's similar. I didn't have any issues. 9 The Sargon hearing for me went great. I haven't 10 run into any sort of problems. But I would be 11 honest with the judge and ask her how I'm supposed 12 to proceed. 13 Q. If you'd look at Exhibit 10. I believe 14 that's what we're looking at. Is that correct? 15 A. Yes. 16 Q. And if I just changed in that question ASD 17 to ADHD so that it read, "Can you cite for me, as 18 you sit here today, any published epidemiologic 19 study on lead or arsenic exposure from any source 20 and ADHD risk that meets all of the following four 21 criteria: 22 Number 1, exposure in the six months to 23 three-year-old time period. 24 Number 2, exposure to doses of lead and 25 arsenic one might reasonably get from baby food.</p>

<p style="text-align: center;">Page 281</p> <p>1 Number 3, increase in the diagnosed 2 outcome of ADHD.</p> <p>3 And Number 4, in a population of U.S. 4 children.</p> <p>5 Can you name such a study, sitting here 6 today, without referring to your report?</p> <p>7 A. I would have to refer to my report to be 8 most responsible. I mean, not doing so would just 9 not be -- you know, I had an oath here. I don't 10 want to be incorrect with any of my statements. 11 It's very important to me to be 100 percent 12 correct.</p> <p>13 Q. I understand. And I would imagine if 14 there was such a study you could cite it off the 15 top of your head. But if you can't --</p> <p>16 A. Absolutely not. Some people could. Some 17 people could. It would absolutely not be me. I'm 18 horrible with names. And it would just not be 19 responsible.</p> <p>20 Q. Do you understand almost 100 percent of 21 lead in the bloodstream is contained within red 22 blood cells?</p> <p>23 A. I am not prepared to opine on that.</p> <p>24 Q. Okay. Do you know the lifespan of a human 25 red blood cell that contains lead?</p>	<p style="text-align: center;">Page 282</p> <p>1 A. I do not know. I'm not prepared to opine 2 on that. It's not part of my charge, not part of 3 what I looked at.</p> <p>4 Q. Do you know that the lifespan of a red 5 blood cell is approximately 120 days?</p> <p>6 A. If you want to show me, I'm happy to look, 7 but I can't --</p> <p>8 Q. Do you know one way or the other?</p> <p>9 A. I can't confirm or deny that fact. I did 10 not come prepared to talk about the lifespan of a 11 red blood cell.</p> <p>12 Q. Can you tell us whether measuring blood 13 in -- excuse me -- measuring lead levels in blood 14 and arriving at a level tells you about a lead 15 exposure that precedes 120 days?</p> <p>16 A. I am not prepared, I guess, to -- I guess 17 you were a little bit broad in just asking me to 18 talk about it.</p> <p>19 Q. I just want to know whether you know, one 20 way or the other.</p> <p>21 A. I guess I'm not prepared to talk about the 22 amount that would be there after that period of 23 time.</p> <p>24 Q. I'm just wondering when you rely on these 25 studies that have blood lead levels in them, how</p>
<p style="text-align: center;">Page 283</p> <p>1 far back do you assume that blood level reflects 2 exposure to lead?</p> <p>3 A. Earlier you brought up the important point 4 that you called it sequestered. I never used that 5 word. It can be -- lead can be stored in bones 6 and be rereleased. So I think that's what you're 7 asking about.</p> <p>8 And yes, I agree with you that lead in 9 your blood is not just indicative of very recent 10 exposure but it can be -- it can reflect past 11 exposure that is, as you called it, sequestered in 12 the bones and then released.</p> <p>13 Q. If you --</p> <p>14 A. If that's what you're asking about.</p> <p>15 Q. If you have a blood lead level that's 16 measured at the time or after your ASD diagnosis, 17 does that give you any information at all about 18 when that person was exposed to that lead?</p> <p>19 A. So as you so rightfully pointed out many 20 times, children are exposed to lead every day. 21 Lead is ubiquitous.</p> <p>22 But what really matters is how much lead, 23 the variability of lead. And that can change over 24 time. So the exposure -- the exposure tends to be 25 higher in children and babies than adults, but not</p>	<p style="text-align: center;">Page 284</p> <p>1 necessarily. Some people are more exposed as 2 adults than when they were younger. And there is 3 variability.</p> <p>4 Q. My question is very simple. If you get a 5 blood lead level measurement, let's say today, can 6 you pinpoint when you were exposed to the lead 7 that resulted in that blood level?</p> <p>8 A. Like you said, you're exposed all the 9 time. So your blood lead level today represents 10 the burden of lead in your blood right now. The 11 exposure may reflect, you know, exposures from the 12 past, including that day, the past month, farther 13 back, but it will vary day by day.</p> <p>14 Q. If a child has a blood lead level measured 15 at four years of age, does that tell you what the 16 child's blood level was under one year?</p> <p>17 A. So it would vary day by day. It would be 18 over time. Typically in these sort of studies we 19 don't measure, you know, blood lead levels every 20 single day. When we go to the doctor, we measure 21 it a couple times in a childhood because that is 22 thought to be relevant.</p> <p>23 It's not like some exposures where, you 24 know, it's literally eliminated within hours.</p> <p>25 And if you're talking about a relevant</p>

<p style="text-align: right;">Page 285</p> <p>1 source, there tends to be some variability but 2 also a lot of correlation over time. 3 It might not be perfectly representative 4 of a week before. But on a population-wide level, 5 it's highly correlated. 6 Q. But a blood lead level in a four-year-old 7 or a seven-year-old or an eight-year-old tells you 8 nothing about when the exposure to that lead 9 occurred. Correct? 10 A. So the exposure to lead happens all the time. 11 Q. And a blood lead level taken of a child at 12 four or seven or eight years of age or any age 13 doesn't tell you the source of the lead. Correct? 14 A. Your blood lead level represents the body 15 burden and it doesn't say whether that blood lead 16 level is from water or from the apples you eat or 17 the spinach that you eat or the house paint or 18 reflects how much prenatal exposure. 19 Just like this is true for other 20 environmental exposure. So for example, PFAS, 21 which is what I study. When we look at the serum 22 concentrations of PFAS, we can't tell if the PFAS 23 comes from the person's couch or the food that 24 they're eating or the water that they're drinking</p>	<p style="text-align: right;">Page 286</p> <p>1 or from their car. It doesn't actually matter 2 because what matters is the neurotoxicant, not as 3 much the exposure. 4 The exposure does matter in terms of 5 actions people can take and regulations that can 6 happen on a population-wide level to protect 7 ourselves. 8 Q. My question is simply, and I think you may 9 have just answered it, getting a measurement of a 10 blood lead level or an arsenic level doesn't in 11 and of itself identify where that exposure came 12 from. Correct? 13 A. That is correct. It doesn't show what 14 foods or what sources. It doesn't really need to. 15 What it does is it -- for these studies, it shows 16 the association between the neurotoxin itself and 17 the outcome, which is what's relevant here. 18 And when I talk to, say, clients who 19 they'll have a high blood lead concentration in 20 their children, they want to be thinking about all 21 exposure sources that they can eliminate. 22 And what I tell my clients is even if your 23 blood lead level is nondetect, you still want to 24 be identifying exposure sources and reducing them 25 because there is no safe level of lead.</p>
<p style="text-align: right;">Page 287</p> <p>1 Q. Have you, yourself, published any 2 recommendations or advised any of your colleagues 3 at the University of Miami that parents should 4 avoid feeding their children commercial baby 5 foods? 6 A. I don't think I've ever talked to any of 7 my colleagues, given them advice about what their 8 kids should eat. 9 I'm in the neurology department. None of 10 my colleagues treat children. My colleagues are 11 all older than me. I can't think of anyone who's 12 actually had children after me. I don't like 13 telling people what they should eat themselves or 14 other people other than sort of in a -- like a 15 professional setting. 16 Nobody has ever asked me or I never told 17 them, you know, feed this to your kids, feed that 18 to your kids. 19 First off, I can't think of any colleague 20 who had a baby after me. 21 Q. So you haven't gone to any of your 22 colleagues, young or older, whether they're 23 research assistants or whatever, and said, "I've 24 been doing a lot of reading. I'm very concerned 25 about heavy metals in baby foods, and you should</p>	<p style="text-align: right;">Page 288</p> <p>1 avoid feeding your children those"? 2 A. I can think of one colleague who maybe I 3 have talked to about her grandchildren. 4 Q. Who is that? 5 A. My colleague named Bonnie. 6 Q. In your department? 7 A. Yeah. 8 Q. Bonnie who? 9 A. Bonnie Levin. 10 Q. And what did you tell her? 11 A. We have talked about -- she's very much on 12 the same page as I am about heavy metal toxicity, 13 and we've talked about heavy metals in various 14 food sources. 15 Q. Does Bonnie feed her grandchildren 16 commercial baby food? 17 A. She doesn't really feed her grandchildren. 18 Q. Do you know whether she knows if her 19 grandchildren are even fed commercial baby food? 20 A. I don't know. 21 Q. Do you agree that baby foods are complex 22 mixtures that contain vitamins and nutrients that 23 are known to be beneficial for healthy brain 24 development? 25 MR. ESFANDIARY: Objection, overbroad,</p>

<p style="text-align: right;">Page 289</p> <p>1 nonspecific.</p> <p>2 A. There's a lot of parts to that question.</p> <p>3 So some baby foods are simple; they'll</p> <p>4 just be a single ingredient. And other baby foods</p> <p>5 have multiple ingredients. Some will have</p> <p>6 cinnamon, like I talked about earlier. A lot of</p> <p>7 the applesauce pouches have cinnamon. I don't</p> <p>8 know if you would call that a complex mixture.</p> <p>9 But there will be -- some baby foods are</p> <p>10 just one ingredient and some baby foods are</p> <p>11 multiple ingredients. The amounts of their</p> <p>12 nutrients will vary.</p> <p>13 Q. Do you consider yourself to be an expert</p> <p>14 on baby food nutrient and nonnutrient interactions</p> <p>15 in the body?</p> <p>16 A. I talked about this in this report. Like</p> <p>17 I've said many times, my understanding of what is</p> <p>18 an expert is someone who knows a lot more than the</p> <p>19 general public. I would say I know a lot more</p> <p>20 than the general public about this. I touched on</p> <p>21 it in my report. There's a whole section about</p> <p>22 it.</p> <p>23 Q. Have you ever held yourself out to your</p> <p>24 colleagues as an expert in the interaction between</p> <p>25 nutrient and nonnutrient components of food?</p>	<p style="text-align: right;">Page 290</p> <p>1 A. I have never held myself out as an expert</p> <p>2 to my colleagues on anything. That just sounds</p> <p>3 very like an awkward thing to do. My colleagues</p> <p>4 recognize me as an expert on diet.</p> <p>5 I can't imagine being like, "Hey, guys,</p> <p>6 I'm the expert in diet. They have more said to</p> <p>7 other people, "Hannah, you know, is an expert on</p> <p>8 diet."</p> <p>9 Q. Have you published on -- any publications</p> <p>10 on how nutrients and nonnutrients interact in</p> <p>11 food?</p> <p>12 A. How nutrients interact? I can't think of</p> <p>13 a paper of mine that -- I don't think -- I'm not</p> <p>14 trying to be nonresponsive, but I can't think of a</p> <p>15 paper of mine that would probably fit what you're</p> <p>16 asking.</p> <p>17 Q. That's very responsive. That's the most</p> <p>18 responsive answer you've given today.</p> <p>19 A. Then our definitions of what's responsive</p> <p>20 are very different.</p> <p>21 Q. You don't consider yourself a</p> <p>22 nutritionist. Correct?</p> <p>23 A. I don't call myself a nutritionist. I do</p> <p>24 call myself a nutritional epidemiologist.</p> <p>25 Q. And on your web page, do you say you're a</p>
<p style="text-align: right;">Page 291</p> <p>1 nutritional epidemiologist with the University of</p> <p>2 Miami?</p> <p>3 A. I have no idea. A friend created my</p> <p>4 website over a decade ago. I have no idea what it</p> <p>5 says. It's so dated.</p> <p>6 Q. Where have you held yourself out in public</p> <p>7 as a nutritional epidemiologist?</p> <p>8 A. I guess -- I'm not really allowed to talk</p> <p>9 about those meetings. I've called myself a</p> <p>10 nutritional epidemiologist to other scientists</p> <p>11 when sort of describing my expertise before.</p> <p>12 Q. That's just verbal descriptions as opposed</p> <p>13 to something that you've, like I said, put on your</p> <p>14 website or your resume?</p> <p>15 A. I have no idea what my website says.</p> <p>16 My resume speaks for itself. I've</p> <p>17 published a ton on nutritional epidemiology.</p> <p>18 Q. I don't think I saw a nutritional</p> <p>19 epidemiologist on your CV, but you can correct me</p> <p>20 if I'm wrong.</p> <p>21 A. What did I put on my CV? I don't see a</p> <p>22 spot where I would have put that or anything, but</p> <p>23 maybe I don't understand, like, the section that</p> <p>24 you'd be looking for.</p> <p>25 What did I say myself?</p>	<p style="text-align: right;">Page 292</p> <p>1 Q. Did you represent in your CV that you're a</p> <p>2 nutritional epidemiologist?</p> <p>3 A. I guess like where have I represented</p> <p>4 myself as something -- I don't recall an area of</p> <p>5 my CV where I'm like I am an environmental</p> <p>6 epidemiologist. I am a nutritional</p> <p>7 epidemiologist. I am an epidemiologist. I just</p> <p>8 don't -- I did say, you know, I'm a research</p> <p>9 associate professor. I put in parentheses</p> <p>10 epidemiology in the department of neurology. I</p> <p>11 said I'm the director of the biostatistics core.</p> <p>12 I wrote that I have a doctorate of science in</p> <p>13 epidemiology.</p> <p>14 I don't see a place where I have said I am</p> <p>15 an epidemiologist. I am an epidemiologist, in</p> <p>16 fact, but I don't see anywhere where I have said a</p> <p>17 sentence like "I am an epidemiologist" or "I am an</p> <p>18 environmental epidemiologist, a</p> <p>19 neuroepidemiologist, a nutritional</p> <p>20 epidemiologist."</p> <p>21 One thing we do when we write grants is we</p> <p>22 don't submit our whole CV. We submit what we call</p> <p>23 a bio sketch, which is a very, very condensed</p> <p>24 version of that. We often include a personal</p> <p>25 statement.</p>

<p style="text-align: center;">Page 293</p> <p>1 And that's a spot where I have included, 2 you know, things like I am a nutritional 3 epidemiologist or I am an environmental 4 epidemiologist or a neuroepidemiologist, depending 5 on sort of the topic of --</p> <p>6 Q. Your testimony is you have represented 7 yourself as a nutritional epidemiologist in such a 8 document?</p> <p>9 A. I have represented myself definitely as a 10 nutritional epidemiologist online. I've 11 represented it -- myself informally, formally, in 12 many different places.</p> <p>13 Q. Have you conducted any analysis comparing 14 the eating behaviors of children with and without 15 autism?</p> <p>16 A. I have not published a study on eating 17 behaviors comparing children with and without 18 autism.</p> <p>19 Q. Are restricted eating patterns and 20 essential nutrient deficiencies in children with 21 ASD a plausible biological mechanism by which 22 children with ASD have higher lead and arsenic 23 levels than children without ASD?</p> <p>24 A. Could you say that again?</p> <p>25 Q. Sure. Are restrictive eating patterns and</p>	<p style="text-align: center;">Page 294</p> <p>1 essential nutrient deficiencies in children with 2 ASD a plausible biological mechanism by which 3 children with ASD have higher lead or arsenic 4 levels than children without ASD?</p> <p>5 A. So I did talk about how lead competes 6 with, like -- with iron and calcium receptors and 7 can impact those levels. I have talked about that 8 a bit in the report.</p> <p>9 I've also talked about how I considered 10 the possibility of restricted eating patterns and 11 whether those could be associated with increased 12 or decreased lead or arsenic exposures.</p> <p>13 I have not seen any evidence to confirm or 14 refute that, but I did consider that possibility. 15 I didn't see any evidence, but that was something 16 that was important for me to think about.</p> <p>17 But I think what you were saying is, is 18 one possibility of the way that lead and arsenic 19 and particularly lead is neurotoxic is the fact 20 that it competes for binding sites with calcium 21 and iron.</p> <p>22 Q. No, that's not what I'm asking.</p> <p>23 I'm asking if the feeding patterns and 24 food selectivity that is more common in children 25 with ASD than children without may affect their</p>
<p style="text-align: center;">Page 295</p> <p>1 blood lead levels. Do you know one way or the 2 other?</p> <p>3 A. Like I said, I haven't seen any evidence 4 to confirm or refute the fact that these selective 5 eating patterns or eating habits are -- tend to be 6 higher in lead or arsenic or lower in lead or 7 arsenic. Yeah.</p> <p>8 I mean, you know, what we see is that 9 children with ASD and ADHD, they have higher body 10 burden of lead.</p> <p>11 And that doesn't necessarily indicate the 12 source nor does it indicate the role of genetics 13 that's impacting how long those toxic heavy metals 14 stay in the body, how they distribute, how they're 15 detoxified.</p> <p>16 Q. So does that mean -- do you believe that 17 genetic changes that result in autism can also be 18 genetic changes that affect children's metabolism 19 of heavy metals?</p> <p>20 A. That's definitely something that I've 21 talked about is how that is an important part of 22 this causal mechanism, that even if a child -- say 23 you have two children and they're both exposed to 24 the same amount of lead, that some children, their 25 genetics, which may be related, as suggested by</p>	<p style="text-align: center;">Page 296</p> <p>1 some of these studies, to their propensity to be 2 autistic or to have ADHD.</p> <p>3 Those genetics may impact -- may affect 4 the impact of the lead, the brain toxicity, how 5 long the lead stays in their body. That's what 6 I'm talking about is the interaction with 7 genetics.</p> <p>8 It seems very plausible to me. I talk 9 about that in my report. That's not confounding. 10 That is part of the causal mechanisms. That's why 11 baby food needs to be safe for everyone.</p> <p>12 That's why I was talking about lead paint 13 earlier.</p> <p>14 Q. I think you may be talking about something 15 a little different.</p> <p>16 My question is, have you entertained the 17 possibility that the genetic changes that can 18 cause autism or ASD, those genetic changes can 19 also affect the way kids metabolize lead or 20 arsenic so that their levels are higher as a 21 result of the genetic mutations?</p> <p>22 A. Absolutely. That's what I talked about in 23 here. But those are not coincidental. There's a 24 plausibility that you have these genes that cause 25 autism.</p>

<p style="text-align: center;">Page 297</p> <p>1 Oh, and by chance they also -- because 2 genes affect different things. Oh, look. They 3 happen to also increase the body burden of these 4 neurotoxins but totally just coincidentally. Just 5 by chance. Not in a way such that the neurotoxins 6 are related. That's just not plausible.</p> <p>7 It's so wildly coincidental and unlikely. 8 It would be like saying, oh, look, there are these 9 genes that increase the risk of lung cancer, and 10 they also affect the metabolism and the toxicity 11 of nicotine but just by chance.</p> <p>12 Not because nicotine causes -- not because 13 cigarette smoking causes lung cancer but just -- 14 they do different things and they happen to both 15 do these same things. That sounds to me wildly 16 implausible.</p> <p>17 Q. But you just pointed out that the same 18 genes can have a variety of different and 19 unrelated biologic effects. Correct?</p> <p>20 A. Yes. Absolutely. What is far more likely 21 is that there are these genes that impact the risk 22 of neurodevelopmental outcomes because they impact 23 how neurotoxins, including heavy metals, impact 24 those diseases.</p> <p>25 Just like we know that the genes -- it's</p>	<p style="text-align: center;">Page 298</p> <p>1 widely assumed that the genes that impact how 2 cigarette smoke is processed in the body, they 3 impact the risk of lung cancer because they do 4 that. Not just coincidentally.</p> <p>5 MR. KLATT: Object to the 6 nonresponsiveness of the answer.</p> <p>7 Can we take a quick break for a second?</p> <p>8 MR. ESFANDIARY: Sure.</p> <p>9 THE VIDEOGRAPHER: This concludes Media 10 Number 7. Going off the record, 5:19 p.m. 11 (Recess, 5:19 p.m. to 5:35 p.m.)</p> <p>12 THE VIDEOGRAPHER: This is the beginning 13 of Media Number 8. Going back on the record, 14 5:35 p.m.</p> <p>15 EXAMINATION BY COUNSEL FOR PLUM, PBC 16 BY MR. SACHSE:</p> <p>17 A. Good evening, Doctor. We've met before. 18 My name is Will Sachse. I represent Plum. I'm 19 going to ask you a few follow-up questions, if 20 that's okay.</p> <p>21 A. Sure.</p> <p>22 Q. I think I'd like to actually start where 23 we ended.</p> <p>24 A few minutes ago I believe you agreed 25 that the genetic changes that can result in autism</p>
<p style="text-align: center;">Page 299</p> <p>1 can also be genetic changes that cause elemental 2 dysregulation in a child. Is that fair?</p> <p>3 A. That's been suggested in the literature as 4 a possibility for what's going on. I talk about 5 that in my report.</p> <p>6 Q. So here's my question: If you've got a 7 study that shows that children with autism have 8 higher levels of lead and lower levels of 9 essential nutrients, how do you go about 10 determining whether that result is due to the 11 genetic changes that lead to autism versus the 12 genetic changes that lead to dysregulation?</p> <p>13 A. Sorry. I'm lost.</p> <p>14 Q. Let me try it again.</p> <p>15 A. Late in the day.</p> <p>16 Q. You agree -- I think you've said this 17 previously -- that genetics play an important role 18 in autism. Right?</p> <p>19 A. Yes. Like all neurological diseases.</p> <p>20 Q. Sure. And I think you'd agree that there 21 are some cases where the autism is due solely to 22 those genetic changes. Correct?</p> <p>23 MR. ESFANDIARY: Objection, misstates her 24 testimony.</p> <p>25 A. You'd have to show me where, you know --</p>	<p style="text-align: center;">Page 300</p> <p>1 where you're taking that from.</p> <p>2 Q. I'm just asking you a question as somebody 3 who has studied in this area.</p> <p>4 A. So that's a question of more of specific 5 causation, whether there are highly penetrant 6 genes that, you know, would make it so that a 7 child would be autistic no matter how much lead 8 they were exposed to.</p> <p>9 Q. Sure. And I understand in the specific 10 causation context. I'm asking more in the general 11 causation context because if you -- let me just 12 ask the question.</p> <p>13 You agree that genetics is a -- plays an 14 important role in causing autism generally. 15 Correct?</p> <p>16 A. Yeah. There's a genetic role in autism.</p> <p>17 There's a lot of sort of uncertainty and 18 debate in terms of how -- the percentage of autism 19 that can be attributed to genetics versus heavy 20 metals.</p> <p>21 There's going to be an overlap. That's 22 what I would say has been more recognized over -- 23 probably since I published my dissertation is, you 24 know, at the time when I was publishing my 25 dissertation we were talking about, like, genetics</p>

<p style="text-align: center;">Page 301</p> <p>1 or environmental factors.</p> <p>2 And over the past, you know, two decades I 3 would say there's a lot more recognition of 4 epigenetic changes and the interplay between genes 5 and environment.</p> <p>6 And so say, for example, I probably do -- 7 as sort of an example, I probably do have genes 8 that would really, really, really increase my risk 9 of lung cancer if I smoked.</p> <p>10 The fact that I don't smoke makes those 11 genes irrelevant. But that's still a risk factor 12 I have. It's only relevant in that context.</p> <p>13 The fact that all children are exposed to 14 lead or the vast majority of children are exposed 15 to lead means that there could be genetic 16 mechanisms related to the neurotoxicity of lead 17 related to genetics that they would apply to any 18 children that had those genes.</p> <p>19 Q. Okay. That's super helpful. So let me 20 see if I can untangle this.</p> <p>21 When you're evaluating a study, how do you 22 go about deciding whether the result that you see 23 of autism is due directly to the genetic changes 24 that cause autism versus indirectly from genetic 25 changes that lead to -- contribute to autism but</p>	<p style="text-align: center;">Page 302</p> <p>1 also can contribute to elemental dysregulation?</p> <p>2 A. It would depend on the genes. I mean, 3 like, what are, like, the -- there are advanced 4 statistical methods that would help disentangle 5 mediation, mediation analyses for example, or 6 interaction analyses.</p> <p>7 At the end of the day, it doesn't always 8 matter, you know. We see that there's this 9 increase in lead burden. And the point is that 10 some children might be just far more -- we know 11 some children are far more susceptible to lead.</p> <p>12 The reason why we -- why we regulated lead 13 out of house paint is not because house paint was 14 going to cause cognitive impairment in every 15 single person but because on a population-wide 16 level there was going to be detriments that was 17 going to be bigger in some people.</p> <p>18 We need to make house paint safe for 19 everyone, just like we need to make toys safe for 20 all children, just like we need to make food safe 21 for all children regardless of how well their 22 bodies metabolize, detoxify, excrete that lead.</p> <p>23 Q. Okay. Thank you for that answer.</p> <p>24 A. It's involved in the causal mechanisms.</p> <p>25 Q. Okay. Thank you for that answer.</p>
<p style="text-align: center;">Page 303</p> <p>1 MR. SACHSE: Respectfully, I'm going to 2 move to strike everything after "It would depend 3 on the genes."</p> <p>4 Q. Let's just move on, and I want to talk now 5 about your specific process.</p> <p>6 When you were looking at all of the 7 studies that you reviewed before forming your 8 opinions here, what was the methodology that you 9 used to determine the extent to which it was -- 10 the results that you were seeing were due to 11 elevated levels of lead or arsenic versus a 12 genetic component, a preexisting genetic component 13 in the children with autism?</p> <p>14 A. I think what you're asking is what are the 15 mechanisms? What are the mechanisms involved in 16 this lead exposure? Do those mechanisms involve 17 genes?</p> <p>18 That wasn't part of my charge. It doesn't 19 actually --</p> <p>20 Q. I'm sorry. I'm asking a different 21 question.</p> <p>22 A. It's hard for me to finish if you're not 23 interrupting me but you're going, like as I talk. 24 It feels like an interruption.</p> <p>25 Q. I apologize. Go ahead.</p>	<p style="text-align: center;">Page 304</p> <p>1 A. So what you're asking me about is what are 2 the mechanisms by which increased body burden of 3 lead is associated on a population-wide level with 4 lead and ADHD. To what degree is genetics part of 5 that mechanism.</p> <p>6 That wasn't really part of my -- part of 7 my charge. For me, I was interested in does an 8 increased body burden of lead and arsenic increase 9 the risk of autism and ADHD. Yes. Yes.</p> <p>10 The evidence shows that increased exposure 11 to lead and to arsenic increases the risk of 12 autism and ADHD. To what extent do -- does 13 genetics modify that exposure? That wasn't part 14 of my charge. I don't have an answer for you to 15 what extent those mechanisms, those mediation -- 16 those mediation components are working.</p> <p>17 I think for this matter it doesn't matter 18 because what we need is, we need the exposures 19 in -- the lead and arsenic exposures in our world 20 to decrease because people don't know what their 21 genetics are.</p> <p>22 In an ideal world where there's much more 23 precision medicine -- we've been talking a lot 24 recently in the medical world about precision 25 exposures.</p>

<p style="text-align: center;">Page 305</p> <p>1 In the future, when you're born and you 2 know your genetics and you're, like, oh, look, me, 3 I am someone who can tolerate lead very well and 4 I'm not, then we can better understand how diet 5 should be modified.</p> <p>6 We're not there yet. In the absence of 7 that, exposures need to be reduced to reduce the 8 burden of autism and ADHD on the population.</p> <p>9 Q. Okay. So I appreciate that lengthy 10 answer. It was not exactly the question I was 11 asking. I know your counsel will object.</p> <p>12 MR. SACHSE: I'm just going to put on the 13 record you have been giving lengthy, lengthy 14 answers that are not directly responsive to 15 questions this entire afternoon. And so we may 16 very well have to go to the Court and seek more 17 time.</p> <p>18 I am going to finish today, but I just 19 wanted to let you know if you let me ask my 20 questions and try to answer them precisely, 21 hopefully we will be done with this today. Okay?</p> <p>22 A. Sure.</p> <p>23 Q. All right. Good. And really I heard you 24 say this wasn't part of my charge to consider the 25 different mechanisms apart from postnatal lead and</p>	<p style="text-align: center;">Page 306</p> <p>1 arsenic exposure. I'm sort of paraphrasing. 2 That's what you were saying. Right? 3 A. I think part of my -- so my charge was 4 to --</p> <p>5 Q. I'm sorry. Let me withdraw. Let me back 6 up and just ask a better question. Okay?</p> <p>7 Your charge was not to consider the role 8 that genetics play in causing autism. Is that 9 right?</p> <p>10 MR. ESFANDIARY: Objection, misstates her 11 testimony.</p> <p>12 A. My role was to determine if lead and 13 arsenic are causally associated with autism and 14 ADHD. To do that, I have to think about genetics 15 and I have to review the entire literature, many 16 of which talked about this, talked about . . .</p> <p>17 So part of the Bradford Hill criteria 18 considered plausibility. Do we -- is there a 19 mechanism involved. And sometimes we can 20 determine that an association is causally 21 associated with the outcome even if we don't know 22 the mechanism yet.</p> <p>23 So there was enough evidence to say that 24 smoking caused lung cancer before we really 25 understood the mechanism. But when we have more</p>
<p style="text-align: center;">Page 307</p> <p>1 data and more understanding of mechanisms, it 2 helps our causal inference.</p> <p>3 So there's been a lot of work sort of 4 thinking about -- and I described it -- what are 5 the potential mechanisms.</p> <p>6 And for me, knowing that genetics plays a 7 role in autism and ADHD, I paid attention to how 8 genetics could be involved in that mechanism.</p> <p>9 So it was part of my charge.</p> <p>10 Q. Okay. Great. What precisely did you do? 11 What method did you use to consider the role of 12 genetics in the results that you were seeing in 13 the studies you rely on?</p> <p>14 A. Yeah. So I talked about it in my report. 15 Should I read it?</p> <p>16 Q. You shouldn't read it. You should just 17 tell me what you did.</p> <p>18 A. At this point in the night it would be a 19 lot easier for me to read it.</p> <p>20 I read the studies. I read the studies 21 looking at the potential role of genetics in these 22 mechanisms and all sorts of mechanisms.</p> <p>23 So I talked about different research in 24 terms of mechanisms. Some of them were in 25 animals. I can talk about them much more clearly</p>	<p style="text-align: center;">Page 308</p> <p>1 if I refer to my report, but I'm unable to just 2 recite that part right now.</p> <p>3 Q. That's fine. I'm really just trying to 4 understand kind of in broad strokes, what did you 5 do to consider whether genetics alone explained 6 the results you were seeing in the postnatal lead 7 and arsenic studies?</p> <p>8 A. Whether all the mechanisms was -- all the 9 causal mechanism related to genetics?</p> <p>10 Q. Exactly.</p> <p>11 A. That's not the assumption is that it's all 12 mediated by genetics. In the literature that -- 13 there's data on other mechanisms too.</p> <p>14 My role here was to review the literature 15 and review it in a really rigorous way, the way I 16 would be if I was publishing this, the way that I 17 would be when I do all of my other research.</p> <p>18 I'm a professor at a medical school, so I 19 do research all the time and I apply the same 20 scientific rigor when creating this report as I do 21 in all -- in any other sort of review that I've 22 worked on or summarizing the literature.</p> <p>23 I didn't exclude studies or commentary 24 that talked about the interplay between genetics 25 and neurotoxins. And I'm not sitting here and</p>

<p style="text-align: right;">Page 309</p> <p>1 being like, oh, you know, genetics are not 2 involved in this. Genetics are believed to be 3 involved in this, just like neuroinflammation, 4 just like oxidative stress, just like disruption 5 of neurotransmitters.</p> <p>6 Q. So I understand -- I mean, what I think 7 you just said is it's all mediated by genetics. 8 My question was a little --</p> <p>9 A. No, I did not say that. If I did, let's 10 strike that because I did not mean to say it's all 11 mediated by genetics.</p> <p>12 Q. Anyway, I'm getting at a different point, 13 which is whether -- how you went about considering 14 whether the results that you're seeing in the 15 postnatal lead studies were due solely to genetic 16 autism factors versus the exposure -- the lead and 17 arsenic exposure?</p> <p>18 A. I guess if I -- if that's all that I saw 19 in the literature and not all the other, you know, 20 powerful work that I would see in here, then one 21 could assume that.</p> <p>22 But, I mean, this is not all about 23 genetics. There's so much more here. And so that 24 makes it clear that it's not all about genetics. 25 My purpose here -- I didn't conduct any</p>	<p style="text-align: right;">Page 310</p> <p>1 original research. I reviewed all of the 2 literature. I reviewed case-controlled studies, 3 cohort studies, cross-sectional prevalence 4 studies. I looked at animal studies. Basically 5 every type of scientific literature there was. 6 And that was -- it was like a review. It 7 wasn't a -- I didn't do any sort of formal 8 calculations or meta-analyses in relation to lead 9 and ADHD. 10 I did create a plot that was sort of 11 similar to a forest plot, but I didn't do any sort 12 of formal interaction analyses between lead and 13 genetics. 14 There's a lot more we need to learn about, 15 you know, all of the genetic variants involved in 16 autism. 17 Q. So I'm actually asking about genetics 18 independent of lead exposure. 19 What did you do to consider whether the 20 results that you were seeing in the postnatal lead 21 and arsenic studies were due to genetics 22 independent of any exposure? 23 A. So I didn't -- my report doesn't focus on 24 genes independent of lead exposure. The focus of 25 my report is lead and arsenic. Whether -- you're</p>
<p style="text-align: right;">Page 311</p> <p>1 saying whether there might be genes that are just 2 much more common in children with ADHD and much 3 seen in relation to higher exposures to lead but 4 just by coincidence. 5 As I explained before, that just doesn't 6 sound plausible. Like, you know, we know there's 7 a genetic component to lung cancer. And you're 8 suggesting that if I were summarizing or reviewing 9 the literature on smoking and lung cancer, to what 10 extent might I consider genes, explaining that 11 association that had nothing to do with the 12 cigarettes, that there are genes out there that 13 increase the risk of lung cancer and -- 14 Q. You're just repeating yourself. 15 A. Yeah. It's hard to understand this stuff. 16 I'm an epidemiologist. This stuff might seem 17 obvious to me. I'm trying to explain it. 18 MR. SACHSE: I'm going to stop you and 19 strike everything after "my report doesn't focus 20 on genes independent of lead exposure," because 21 that was my question. 22 MR. ESFANDIARY: So you just interrupted 23 the witness in the middle of responding to your 24 question. 25 That's fine. It doesn't matter.</p>	<p style="text-align: right;">Page 312</p> <p>1 What time are we on the record? 2 THE VIDEOGRAPHER: 6 hours and 43 minutes. 3 MR. KLATT: All right. 4 Q. Let me -- and again, I'm really trying to 5 be precise here. 6 A. I'm trying to answer it as best as I can, 7 as responsibly as I can, because I don't want to 8 misrepresent myself. I know what you want is 9 little, short snippets that answer your questions 10 the way you want them, but I have a responsibility 11 to represent my opinions accurately. And that 12 might take more explanation. I'm doing my best. 13 Q. And I appreciate that you're doing your 14 best. I know it's the end of a long day. We're 15 all doing our best. 16 So you said that your report doesn't focus 17 on genes independent of lead exposure. 18 As part of your analysis of the evidence 19 in this case, did you consider the role of genes 20 independent of lead exposure? 21 A. Yeah. 22 Q. And how did you do that? What was the 23 methodology that you used to consider the role of 24 genetics in autism independent of lead exposure? 25 A. I reviewed the literature with that in</p>

<p style="text-align: right;">Page 313</p> <p>1 mind, understanding that there are other risk 2 factors for autism and ADHD. I think it's 3 important to have that as a scientist, 4 understanding that in mind.</p> <p>5 You know, reviewing all of these 6 discussions and thinking about the fact that there 7 are kids who are going to have ADHD regardless of 8 how much lead they are exposed to or how much 9 arsenic they are exposed to. And there's going to 10 be other kids who can be exposed to a real lot of 11 lead and not develop autism or ADHD. That was 12 important for me to understand.</p> <p>13 I guess what you're asking is how -- what 14 was the process for me in terms of understanding 15 the overall etiology of these outcomes. And that 16 involves reading -- how many papers? 556 papers 17 over the years.</p> <p>18 Q. 557.</p> <p>19 A. Oh, right, 557. Yes. 557. And I've been 20 reading about autism since I was a student, since 21 one of my professors, you know, asked me to help 22 him do this really, really important work on 23 autism. It wasn't something that I thought about 24 before then. So I have had decades of sort of 25 learning about this condition. This isn't</p>	<p style="text-align: right;">Page 314</p> <p>1 something that I -- that Pedram called me about. 2 Sometimes lawyers will call me and I'll 3 have to learn about a whole new thing I know 4 nothing about. This was not the case.</p> <p>5 I have been studying autism since I was 6 not a baby but it felt like I was a baby in my 7 20s.</p> <p>8 Q. And so switching to another area which you 9 touched on earlier, which is prenatal exposure to 10 heavy metals.</p> <p>11 What was the methodology -- when you were 12 looking at these postnatal lead and arsenic 13 studies, what was the methodology you used to 14 determine the extent to which the results that you 15 were observing were due to prenatal versus 16 postnatal exposure?</p> <p>17 A. Yeah. So I reviewed the literature on 18 prenatal exposure as well. I'm not here to, like, 19 opine on whether prenatal exposure to lead or 20 arsenic causes ASD. I haven't scrutinized the 21 literature to that extent. But I read a lot of 22 it. I read a lot of studies. And so I thought 23 about, you know, is there an association?</p> <p>24 The associations are not as consistent. 25 They're not as strong as they are for postnatal</p>
<p style="text-align: right;">Page 315</p> <p>1 exposure. But I did read that there is evidence 2 that prenatal exposure also matters. And I 3 thought about the fact that these children are all 4 born already exposed to lead and to arsenic.</p> <p>5 If it was a hypothetical biospecimen that 6 didn't reflect postnatal exposure, that only 7 reflected prenatal exposure, I would be a little 8 bit more doubtful about, you know, making 9 inferences about the role of postnatal exposure.</p> <p>10 That's not the case. We know that 11 children are exposed and we know that these -- 12 that lead is cumulative. And it is probably true 13 that an increased exposure prenatally might 14 increase, you know, a child's vulnerability to 15 that postnatal exposure, which is all the more 16 reason why we need to decrease postnatal 17 exposures.</p> <p>18 The fact that there are exposures outside 19 of food just underscores the fact that we need to 20 reduce the exposure in food more. The fact that 21 each individual exposure is not the only exposure 22 highlights the importance of reducing exposure to 23 all of them because they add up.</p> <p>24 Q. So after reading all of the studies, what 25 further methodology did you apply to assess</p>	<p style="text-align: right;">Page 316</p> <p>1 whether the results you're seeing in the postnatal 2 lead and arsenic studies are explained by 3 postnatal exposure versus maybe they're solely 4 explained by prenatal exposure?</p> <p>5 A. You're saying there is a hypothetical that 6 kids who -- that kids who were exposed 7 postnatally, it's so highly correlated with their 8 prenatal exposure that it's really the prenatal 9 exposure?</p> <p>10 Q. That's not right.</p> <p>11 A. I did think about that.</p> <p>12 Q. But that's not the question I asked, 13 though.</p> <p>14 What I'm asking is whether you considered 15 after reviewing all the literature, whether you 16 considered that observations you were seeing in 17 the postnatal literature were, in fact, due to -- 18 due solely to those children's prenatal exposure 19 to lead and arsenic?</p> <p>20 A. That's actually the same thing. I just 21 said it in a more sort of scientific -- in a more 22 science way.</p> <p>23 I think that argument would be -- that 24 would have weighed on me much more if we saw this 25 huge convincing science about -- strong science</p>

<p style="text-align: center;">Page 317</p> <p>1 about the prenatal exposure that was so much 2 stronger than the postnatal exposure, then that 3 might have weighed on me more, that possibility. 4 I don't think that they are perfectly correlated. 5 And in any sort of related science, I 6 haven't seen the argument that, you know, it 7 doesn't really matter what the postnatal exposure 8 is. It's so highly correlated, it's all being 9 driven by the prenatal.</p> <p>10 If that were true for autism, it would be 11 true for other neurotoxicity too.</p> <p>12 As a society, we care about postnatal lead 13 exposure neurotoxicity. That's talked about in 14 abundance. It's also -- prenatal exposure is 15 also -- is also relevant.</p> <p>16 If your hypothetical was true, it's 17 perfectly correlated with prenatal exposure and 18 all being driven by prenatal exposure, that 19 argument would be made across the board for all 20 neurodevelopment, for all neurotoxicity.</p> <p>21 We see so many medical organizations talk 22 about the fact that postnatal lead exposures are 23 relevant for neurotoxicity and neurodevelopment. 24 It would be so weird if autism was this weird 25 exception to that.</p>	<p style="text-align: center;">Page 318</p> <p>1 Q. I'm going to switch gears because I'm 2 running out of time here. 3 At the beginning of this deposition, you 4 agreed that you previously had given reports in 5 the baby food litigation in the NC case, in the 6 Landon case, and the class action. Is that right? 7 A. There have been two class actions. There 8 was a -- there was a baby food class action and 9 then there was an infant formula class action. 10 And there's also been some other studies that 11 haven't gone to deposition. 12 Q. This is easy. You stand by the opinions 13 you've previously given. Correct? 14 A. I'm not here to correct any opinions I've 15 given in the past. 16 Q. I think you said that earlier. 17 In the Landon case, you also offered the 18 opinion that exposure to mercury postnatally can 19 cause increased -- can cause autism and ADHD. Is 20 that right? 21 A. That's correct. 22 Q. And when you formed that opinion, did you 23 use the same methodology that you used to form the 24 opinions related to lead and arsenic? 25 A. Yes. But I haven't updated my opinion</p>
<p style="text-align: center;">Page 319</p> <p>1 since that was dropped from this case. I don't 2 have any other standing cases that I'm working on 3 right now that have to do with mercury. So my 4 being up to speed on the mercury issue is maybe 5 six months behind lead and arsenic.</p> <p>6 Q. Okay. You're anticipating what I'm 7 getting at.</p> <p>8 So you are not offering opinions about 9 whether mercury increases the risk of autism or 10 ADHD. Is that right?</p> <p>11 A. That was not part of my charge for this 12 case. My understanding is that it might be for 13 other cases, but for this case it wasn't.</p> <p>14 And so as a result, since I think March is 15 when I had the deposition where mercury was 16 involved, I have not updated. I haven't looked at 17 the literature since then in case something big 18 came out. I haven't seen it.</p> <p>19 Q. Okay. But when you were given your charge 20 by the plaintiff's lawyers in this case, mercury 21 was not part of that charge. Correct?</p> <p>22 A. That is correct.</p> <p>23 Q. I want to talk a little bit more about 24 nutrients. You have not -- you're not offering 25 any expert opinions on absorption, distribution,</p>	<p style="text-align: center;">Page 320</p> <p>1 metabolism, or excretion of metals in this case, 2 are you?</p> <p>3 MR. ESFANDIARY: Objection, misstates her 4 testimony.</p> <p>5 A. I'm sorry. It's the end of the day. Can 6 you repeat that?</p> <p>7 Q. That's okay. I don't need that.</p> <p>8 You haven't studied how nutrients compete 9 with nonnutritive metals in the body to bind to 10 transporters, are you?</p> <p>11 A. Are you asking -- I think it depends on 12 sort of how you -- you say have I studied. 13 Obviously I have reviewed the literature. It's a 14 huge part of this report. I have not published 15 anything on that myself as an author.</p> <p>16 Q. And outside of studying that in connection 17 with this litigation, have you ever previously 18 investigated how nutrients compete with metals in 19 the body to bind to transporters?</p> <p>20 A. I don't know how what you're asking is 21 different from me saying that I haven't published 22 on it myself.</p> <p>23 I don't have -- nor do I have any, like, 24 ongoing analyses that I haven't published yet on 25 that. All of my work on that topic has been in</p>

<p style="text-align: center;">Page 321</p> <p>1 terms of the literature review for this case and 2 for other -- the class action cases involve that 3 too.</p> <p>4 I employ the same methodology in creating 5 this report as I would be if I were writing a 6 review article for publication or in any sort of 7 white paper or work as part of my academic work. 8 But I haven't published on that.</p> <p>9 Q. Okay. You're not offering any expert 10 opinions in this case about which essential 11 nutrients compete with which heavy metals at which 12 sites, which transporter cells within the body, 13 are you?</p> <p>14 MR. ESFANDIARY: Objection, misstates her 15 testimony.</p> <p>16 A. I'm not offering any opinions beyond that 17 which I have in here. So I don't want to say -- 18 I'm not saying that and then I've actually written 19 something in my report.</p> <p>20 So I guess I have no plans to opine on 21 that beyond what I have in here. If some research 22 comes out between now and this hearing, that would 23 be relevant. I can't say I wouldn't rely on that 24 in terms of forming my opinions.</p> <p>25 I don't think I'm going to be -- that's</p>	<p style="text-align: center;">Page 322</p> <p>1 not a main part of my focus, I guess. 2 Q. You read my mind, Doctor. That is what I 3 was getting at.</p> <p>4 So -- and you've referred now to the work 5 that you did specific to nutrients in this 6 litigation.</p> <p>7 And am I correct that the studies that you 8 reviewed that led you to the conclusion that the 9 evidence is inconclusive, those were all studies 10 about supplementation of nutrients in children 11 with high levels of lead exposure or arsenic 12 exposure?</p> <p>13 MR. ESFANDIARY: Objection, misstates. 14 A. No.</p> <p>15 MR. ESFANDIARY: Go ahead.</p> <p>16 A. No. It was a long section. There were so 17 many different kinds of studies. The results were 18 all over. They're largely showing no association, 19 which is why I said it was inconclusive.</p> <p>20 What you describe really just represents 21 such a small portion of the evidence that informed 22 my opinions on that. There was so much.</p> <p>23 Q. I'm running out of time, so just a couple 24 more questions.</p> <p>25 I think you previously testified that you</p>
<p style="text-align: center;">Page 323</p> <p>1 reviewed some of the expert reports from the 2 defense experts in this case, in this litigation. 3 Is that right?</p> <p>4 A. That is correct.</p> <p>5 Q. Okay. And did you review the expert 6 report of Dr. Fombonne?</p> <p>7 A. In this one?</p> <p>8 Q. Yes.</p> <p>9 A. I have definitely reviewed stuff from 10 Dr. Fombonne in the past. I'm not sure if I did 11 from this round.</p> <p>12 Q. Did you review -- do you recall any 13 defense epidemiology opinions that you reviewed 14 after submitting your report but before submitting 15 your rebuttal in this litigation?</p> <p>16 A. After submitting my report. I think what 17 I reviewed was all before the rebuttal. My 18 understanding was that they were -- the charge was 19 only -- the rebuttal was only in relation to 20 commenting on whether Dr. Jones's new estimates 21 changed my opinion. And that was the extent of 22 what I was asked to do.</p> <p>23 Q. Did you see some criticisms of some of 24 your opinions that the defense experts offered?</p> <p>25 A. Criticisms? I don't think I saw</p>	<p style="text-align: center;">Page 324</p> <p>1 criticisms of my -- I guess you could call it 2 criticisms.</p> <p>3 I do remember seeing my name in relation 4 to the fact that my name kept coming up in that 5 there were criticisms of Dr. Jones's calculations 6 that then I relied upon. I haven't read -- I've 7 read very small portions of those expert reports.</p> <p>8 Q. When you reviewed those small portions of 9 the expert reports, did you see anything that you 10 thought was incorrect that you wanted to respond 11 to?</p> <p>12 A. I wouldn't say I want. Honestly, I never 13 choose to do a rebuttal. I am perfectly happy 14 with their -- with rebutting things at deposition, 15 at hearing. It's just more work for me. It's not 16 that I agreed with everything that was written by 17 any means, but I never said to the lawyers, you 18 know, I must create a new report on this.</p> <p>19 Q. So I just told your counsel -- you saw 20 some baseball hand signals there. I'm --</p> <p>21 A. We're a little bit over time. I'm okay.</p> <p>22 Q. We're at time. I just have literally 23 three or four more questions.</p> <p>24 A. Okay.</p> <p>25 Q. The first question, sitting here today,</p>

<p style="text-align: right;">Page 325</p> <p>1 there's nothing that you saw in those defense 2 expert reports that you wanted to include in a 3 rebuttal?</p> <p>4 A. I didn't rebut anything. I didn't agree 5 with, like, the little things -- all the little 6 things that I saw. I didn't feel -- I didn't want 7 to write anything.</p> <p>8 Q. That's fair. You're under oath, after 9 all.</p> <p>10 Second question: Would you agree or do 11 you agree, Doctor, that there are no studies -- no 12 epidemiology studies specifically examining 13 whether commercial baby food causes autism or 14 ADHD?</p> <p>15 MR. ESFANDIARY: Objection, asked and 16 answered previously.</p> <p>17 A. Oh, I've gotten that question before.</p> <p>18 Q. Today?</p> <p>19 A. I mean, probably. It's a classic that's 20 fun to recycle.</p> <p>21 I haven't seen any studies comparing kids 22 who are autistic and kids who are not and the 23 amount of commercial baby food they have consumed. 24 It could be out there. I would be surprised if it 25 was out there and I didn't see it.</p>	<p style="text-align: right;">Page 326</p> <p>1 My charge related to heavy metal and 2 irrespective of sources. Just like when I study 3 PFAS, I study PFAS body burden irrespective of the 4 sources.</p> <p>5 Q. And I shouldn't have said three questions.</p> <p>6 A. We can do one more. I'm not going to hold 7 you to three.</p> <p>8 Q. Well, this is my last question, so I want 9 to make it count.</p> <p>10 A. Do it.</p> <p>11 Q. I know. Yes, I am, though, because it's 12 kind of a big one.</p> <p>13 Previously in response to questioning from 14 my co-counsel you agreed that you considered 15 confounders when evaluating the postnatal lead and 16 arsenic studies.</p> <p>17 Can you give us the list of the 18 confounders that you considered?</p> <p>19 A. I would say for most studies or -- not for 20 most studies. For a lot of studies I mentioned, 21 the ones that were considered -- I don't have an 22 exhaustive list.</p> <p>23 Q. And when you say you mentioned, you're 24 sort of gesturing towards your report.</p> <p>25 So you mentioned the confounders that you</p>
<p style="text-align: right;">Page 327</p> <p>1 considered in the text of your report. Is that 2 fair?</p> <p>3 A. I talked about confounders. Yup.</p> <p>4 Q. And so we can rely on your report for the 5 universe of confounders that you considered when 6 evaluating those studies. Is that fair?</p> <p>7 A. I don't know if that's fair.</p> <p>8 Q. Sitting here today, are there any 9 confounders other than what you've put in your 10 report that you considered when evaluating those 11 studies?</p> <p>12 A. I wouldn't say there aren't any that I 13 didn't consider. I mean, I considered 14 confounding. I considered, you know . . .</p> <p>15 Q. Now that I think we're fully in Alice in 16 Wonderland, I have no further questions.</p> <p>17 MR. ESFANDIARY: Cool. Thank you. No 18 questions.</p> <p>19 THE VIDEOGRAPHER: This concludes the 20 deposition of Hannah Gardener, Sc.D. Going off 21 the record, 6:16 p.m.</p> <p>22 (Off the record at 6:16 p.m.)</p>	<p style="text-align: right;">Page 328</p> <p>1 COMMONWEALTH OF MASSACHUSETTS 2 SUFFOLK, SS.</p> <p>3</p> <p>4 I, Michelle Keegan, Registered Merit Reporter 5 and Notary Public in and for the Commonwealth of 6 Massachusetts, do hereby certify that HANNAH E. 7 GARDENER, Sc.D., the witness whose deposition is 8 hereinbefore set forth, was duly sworn by me and 9 that such deposition is a true record, to the best 10 of my ability, of the testimony given by the 11 witness.</p> <p>12 I further certify that I am neither related to 13 or employed by any of the parties in or counsel to 14 this action, nor am I financially interested in 15 the outcome of this action.</p> <p>16 In witness whereof, I have hereunto set my hand 17 and seal this 1st day of August, 2025.</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22 Notary Public</p> <p>23 My commission expires:</p> <p>24 May 15, 2026</p> <p>25</p>

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1 E R R A T A S H E E T

2 I, HANNAH E. GARDENER, SC.D., do hereby certify
3 that I have read the foregoing transcript of my
4 testimony, and further certify that said
5 transcript is a true and accurate record of my
6 testimony (with the exception of the following
7 corrections listed below):

8 Page Line Correction

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21 Signed under the pains and penalties of perjury
22 this day of , 2025.

23

24

25 HANNAH E. GARDENER, SC.D.